



A STUDY ON LITERATE IMMIGRATION TO MAJOR CITIES IN TAMIL NADU STATE

Statistics

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KEYWORDS

INTRODUCTION

Migration is one of the determinants of changes in the size and structure of population in any area. Internal migration does not change the size of the population of an area. Migration is defined as a moment of population from one place or location to another place. Urban population growth is mainly due to immigration in urban area than the other factors.

An acceleration of migration from rural area to urban area is due to small land holding, unemployment, underemployment and growth of rural population. Major cities in India have been receiving population through immigration. The Studies on migration are important to administrators, planners, demographers and researchers. This study pictures the immigration in five major cities in Tamil Nadu State with an objective to study the pattern of literate immigration in these cities.

DATASOURCE

MIGRATION TABLE: CENSUS OF INDIA 1991, SERIES 23, TAMILNADU.

METHODOLOGY  
STATISTICAL MEASURES

Statistical measures refers to measures of a central tendency, measures of dispersion, measure of skewness and measure of kurtosis. These four measures describes the nature of the distribution. Arithmetic mean is one of the measures of central tendency, applied in this analysis. It is defines as follows:

For a set of observations  $X_1, X_2, \dots, X_n$  arithmetic mean defined as

$$\bar{X} = \frac{\sum_{i=1}^n X_i}{n}$$

For a given frequency distribution arithmetic mean is defined as

$$\bar{X} = \frac{\sum_{i=1}^n f_i X_i}{\sum_{i=1}^n f_i}$$

Statistical Model  
Model

A model is a simplification of reality. A model is an abstract representation of reality which clears what is relevant to a particular questions at a particular time and neglects all other aspects. A model establishes the main variables involved and connects them by means of mathematical statements. A model involving a random variable or chance factors is called as a stochastic model or a probabilistic model. Probabilistic model may also be called as statistical model.

Exponential Model

The exponential density function of the random variable X is defined as

$$f(x) = \begin{cases} \lambda e^{-\lambda x} & ; x \geq 0 \\ 0 & ; otherwise \end{cases}$$

Since, the age distribution of literate immigrants is in skew nature, truncated exponential model was proposed to study the skew nature of the age distribution of literate immigrants.

The truncated model for the random variable X is defined as

$$g(x) = \frac{f(x)}{p(x \geq a)} ; x \geq a$$

In the case of exponential distributions it is obtained as

$$g(x) = \frac{f(x)}{p(x \geq a)} ; x \geq a$$

where,  $p(x \geq a) = \int_a^{\infty} \lambda e^{-\lambda x} dx$

$$= \lambda \int_a^{\infty} e^{-\lambda x} dx$$

$$= \lambda \left[ \frac{e^{-\lambda x}}{-\lambda} \right]_a^{\infty}$$

$$= \lambda [0 - e^{-\lambda a}]$$

$$= -(-e^{-\lambda a}) = e^{-\lambda a}$$

$$\therefore g(x) = \frac{f(x)}{p(x \geq a)} ; x \geq a$$

$$= \frac{\lambda e^{-\lambda x}}{e^{-\lambda a}} = \lambda e^{-\lambda x} e^{\lambda a}$$

$$= \lambda e^{-\lambda x + \lambda a}$$

$$g(x) = \lambda e^{-\lambda(x-a)} ; x \geq a$$

DATAANALYSIS

Data about the literate immigrants to five major cities have been obtained and presented in table No.1.

TABLE - 1  
OBSERVED AGE DISTRIBUTION OF LITERATE IMMIGRANTS TO THE FIVE MAJOR CITIES

Age Interval	Name of the Cities				
	Chennai	Salem	Coimbatore	Tiruchirappalli	Madurai
10-20	17370	900	4570	2790	2180
20-30	77160	2820	17740	7940	8330
<b>30-40</b>	<b>102130</b>	<b>5200</b>	<b>21410</b>	<b>14380</b>	<b>13538</b>
40-50	83870	4110	16830	11510	12250
50-60	50676	2080	9070	6510	7840
60-70	21790	880	4350	2912	4230
70-80	7120	220	1210	1050	1330
>80	2280	60	330	230	340

The age distribution of literate immigrants shows the skewed pattern of immigration. More number of literate immigrants to the five major cities in Tamil Nadu State are observed in the age group of 30-40 years.

The average age of the literate immigrants in five major cities are obtained and presented in table no.2.

**TABLE -2**  
**AVERAGE AGE OF LITERATE INMIGRANTS IN FIVE MAJOR CITIES**

Name of the Cities	Average age Estimates of Inmigrants in the Five Major Cities
Chennai	39.401
Salem	39.1456
Coimbatore	38.1518
Tirucherappalli	39.8014
Madurai	41.471

The information in table 2 shows that average age of literate immigrants in Madurai (41.47) is larger than the other cities. The average age of literate immigrant in Coimbatore (38.1518) is lesser than the other cities, because Coimbatore is an Industrial city.

Truncated exponential model has been proposed to describe the age distribution of the literate immigrants in five major cities of Tamil Nadu.

$$\begin{aligned}
 G(x) &= P\{X \leq x\} \\
 &= \lambda \int_a^x e^{-\lambda(t-a)} dt \\
 &= \lambda e^{a\lambda} \int_a^x e^{-\lambda t} dt \\
 &= \lambda e^{a\lambda} \left[ \frac{e^{-\lambda t}}{-\lambda} \right]_a^x \\
 &= \lambda e^{a\lambda} \left\{ \frac{e^{-\lambda x} - e^{-\lambda a}}{-\lambda} \right\} \\
 &= -\{e^{a\lambda} \cdot e^{-\lambda x} - e^{a\lambda} \cdot e^{-\lambda a}\} \\
 &= -\{e^{-\lambda(x-a)} - e^0\} \\
 &= \{e^{-\lambda(x-a)} - 1\}
 \end{aligned}$$

$$G(x) = 1 - e^{-\lambda(x-a)}; x \geq a$$

where a is the threshold age of literate immigrants.

**Estimates of the parameters**

The parameters of the truncated exponential distribution are estimated using method of maximum likelihood and presented as follows:

$$\begin{aligned}
 \hat{a} &= \min(x_i) = 15 \\
 \hat{\lambda} &= \frac{\sum f}{\sum f(x-a)}
 \end{aligned}$$

These estimates are obtained for the age distribution of literate immigrants in five major cities and presented in table no.3.

**TABLE -3**  
**ESTIMATE OF THE PARAMETERS OF THE TRUNCATED EXPONENTIAL DISTRIBUTIONS**

Name of the Cities	Estimates	
	$\hat{a}$	$\hat{\lambda}$
Chennai	15	0.0406
Salem	15	0.0409
Coimbatore	15	0.0426
Tiruchirappalli	15	0.0398
Madurai	15	0.0375

The expected number of literate immigrants in five major cities are obtained and presented in table no.4.

**TABLE -4**  
**EXPECTED AGE DISTRIBUTION LITERATE IMMIGRANTS IN FIVE MAJOR CITIES**

Age Interval	Name of the Cities				
	Chennai	Salem	Coimbatore	Tiruchirappalli	Madurai
10-20	0	0	0	0	0
20-30	120931	5462	26194	15529	15647
<b>30-40</b>	<b>80561</b>	<b>3628</b>	<b>17103</b>	<b>10435</b>	<b>10753</b>
40-50	53707	2409	10096	7001	7390
50-60	35768	1601	8374	4711	5084
60-70	23846	1064	4772	3160	3488
70-80	15873	798	3111	2124	2402
>80	31710	1398	5860	4342	5274

The figures 1 and 2 are drawn using the information given table no. 1 and 4.

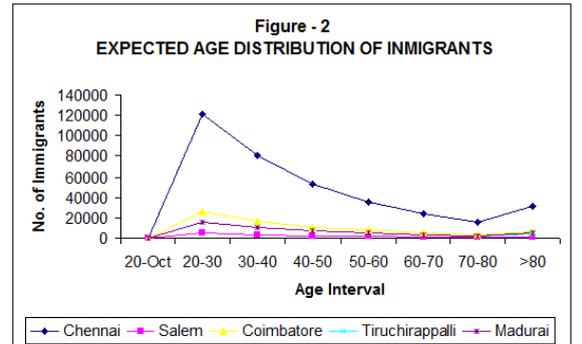
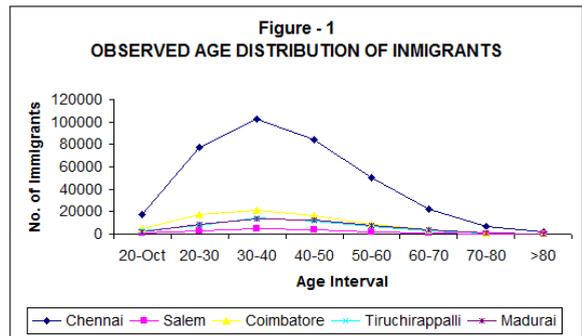


Figure 1 points out that more number of literate immigrants are in the age group of 30-40 in all five major cities. Figure 2 shows that more number of expected literate immigrants are only in the age group of 20-30 in all five major cities.

Figure 1 and 2 indicates the closeness of the observed and expected age distribution of literate immigrants to the five major cities.

**CONCLUSION**

Immigration played vital role in shaping the size and structure of the urban population. Literate is one of the major pull factors of migration. Literate Immigration to five major cities in Tamil Nadu State were studied and observed the followings:

- More number of literate immigrants to five major cities are only in the age group of 30-40 years.
- The age distribution of literate immigration in five major cities are observed in skew nature.
- Truncated exponential model has been fitted to the distribution and compared the observed and expected number of literate immigrants in five major cities.
- The average age of literature immigrants to industrial cities (Coimbatore) is low and high in Madurai city.
- Figure 1 and 2 reflects the least difference between the observed and expected number of literate immigrants and it show the suitability truncated exponential model to the data.

**SUGGESTED MEASURES**

Immigration from rural to urban center may be minimized by means of providing employment opportunity in rural area.

### References

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