# URBANIZATION IN TAIWAN: 1900-1985†

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Urbanization is a global trend to which Taiwan is no exception. Throughout most of this century, Taiwan has experienced rapid urban population growth as well as rapid population increase. These rapid changes have received attention from scholars and policy makers. Many studies have explored the trend of urbanization and its determinants and consequences. However, due to the use of different indicators and sources of data, the study of different geographical areas, and the observation of different time periods, inconsistent findings on this subject have not been uncommon. Aiming to clarify and to resolve this inconsistency through a review of existing literature and statistical data, this paper first attempts to identify the level of urbanization in different periods of time and then examines the role of migration in relation to urbanization.

The concept of urbanization has been treated in many different contexts (Davis, 1955; Hauser & Schnore, 1965; Goldscheider, 1983). The most often used concept of urbanization refers to the proportion of the total population concentrated in urban settlements or else to a rise in this proportion (Davis, 1965). In conceptual schemes urbanization is sometimes differentiated from urban growth, which refers to an increase in the size of the urban population; but in empirical studies these two terms are often used interchangeably. The conventional usage of the terms will be maintained throughout the paper.

## I. OVERVIEW OF POPULATION GROWTH AND URBANIZATION

The accurate counting of population in Taiwan started in 1905 when the first census was conducted during Japanese occupation (1895-1945). By 1905 Taiwan had a total population of 3,039,751 people including 57,335 Japaneses (or 1.9%). By 1943 the total population doubled to 6.6 million. Right after World War II about half a million Japanese went back to Japan reducing the population to about six million. From 1946 to 1950 about a million civilians and army members retreated from Mainland China to Taiwan which accelerated population growth to 7.5 million in 1950. By the end of 1986 the total population was over 19 million, more than six times of the size at the beginning of the century.

Before 1915 the population growth rate was small. During the 1905-1915 intercensus period the annual rate of growth for Taiwan's population was 1.12%; since then the rate of growth has accelerated. By 1940 total population was increasing at the rate of 2.42% per annum (Barclay, 1954:13). The annual rate of population growth peaked at 3.57% during 1950-60 period; since then it has declined continuously. By 1985 the annual growth rate had declined to 1.28%, almost as low as the level of 1915.

Parallel to population growth Taiwan also experienced rapid urbanization. Before 1920 not many people lived in urban places. In 1900 only 14.1% of the total population lived in places over 2,500 population. In 1920 the proportion was 18.4%; it was 24.7% in 1940, and 32.2% in 1958 (Chen, 1959:277). By 1980 61.6% of the total population was classified as urban (Tsai, 1982b:220). This indicates the much faster growth rate of urban population than that of total population. The annual growth rate of urban population during 1900-20 period was 3.40%; it was 5.77% for the 1920-40 period, 6.84% for the 1940-58 period, and 5.41% for the 1972-80 period.[1]

Rapid urbanization has been associated with sweeping modernization which makes the large proportion of people living in cities possible. As shown in Table 1 and Figure 1 the proportion of population living in urban places is highly correlated with the percentage of non-agricultural employment, a rough measure of modernization. The correlation coefficient for these two variables in the present study is 0.79. In 1905, 73.4% of the labor force was engaged in agriculture and fishing; only 6.2%

was engaged in manufacturing and 6.7% in commerce (Barclay, 1954:58). According to the Taiwan-Fukien Demographic Fact Book, in 1986 the proportion engaged in agriculture and fishing had declined to 24.7% and the proportion in manufacturing and commerce has increased to 48.5%.

Although the rate of change in the proportion urban is not exceptionally rapid, the rapid change in economic structure and the rapid increase of the urban population imply an unbalanced growth of city and countryside which is equalized through migration. Ravenstein (1889) in his classical "Laws" suggested that regional imbalance of population and resources were crucial in the explanation of inter-regional migration. According to Ravenstein, technological development and human motivation are the key factors determining migration. As long as human beings have the motivation to improve their lives, they will always look for places where there are better opportunities to achieve their goals. Concommitant with technological development are changes in economic structure and imbalances in population and resources. In other words, if technology remains unchanged, the economic structure is likely to remain unchanged; if technology changes, the economic structure is likely to change, after which population adjustments will occur. If the economic base expands, population will expand also, and if it contracts, population will contract.

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(1) The definitions of urban population were inconsistent throughout the period investigated. Before 1958 the data were drawn from Chen (1959). The urban population was defined as: 1) people residing in a settlement over 25,000 population; 2) people residing in a rural township with the following characteristics: a. with population size between 2,500-25,000; b. possessing a major street over 100 meters long with a shop index over 50%; c. providing nearby rural areas with economic, social, educational, cultural and recreational services.
The data for 1972 and 1980 were calculated from Tsai (1982b) in which the definition of urban population originated from Liu (1975).
A village or neighborhood with at least one of the following characteristics is defined as an Urban Locality:
1) over 60% of the total employment is non-agricultural;
2) over three urban facilities;
3) a population density of over 2,000 persons per square kilometer;
4) where a local administrative office is located;
5) an area surrounded by places having any of these characteristics.

Table 1: Population Growth, Modernization, and Urbanization

| Year | Total Population (a) | Annual Rate of Change (%) | Urban Pop. (b) | Annual Rate of Change (%) | (b)/(a) (%) | Non-agri. Pop./ Emp. Pop. (%) |
|---|---|---|---|---|---|---|
| 1900 | 2,846,108 | | 400,536 | | 14.07 | — |
| | | 1.12 | | | | |
| 1905 | 3,039,751 | | — | | — | 25.56 |
| | (2,973,280) | 0.83 | | 3.40 | | |
| 1915 | 3,479,922 | | — | | — | 25.53 |
| | (3,325,755) | 0.98 | | | | |
| 1920 | 3,655,308 | | 672,990 | | 18.41 | 27.57 |
| | (3,466,507) | 2.37 | | 5.77 | | |
| 1940 | 5,872,084 | | 1,449,440 | | 24.68 | 34.11 |
| | (5,510,259) | 2.98 | | 6.84 | | |
| 1958 | 10,039,435 | | 3,233,560 | | 32.21 | — |
| | | 3.00 | | — | | |
| 1972 | 15,289,048 | | 7,660,287 | | 50.10 | 66.90 |
| | | 1.90 | | 5.41 | | |
| 1980 | 17,805,067 | | 10,975,595 | | 61.64 | 71.08 |
| | | 1.63 | | 4.76 | | |
| 1985 | 19,258,053 | | 13,590,000 | | 70.57 | 75.30 |

Source: Data for total population before 1958 were adopted from Barclay (1954:13), after 1972 adopted from Taiwan-Fukien Demographic Fact Book, ROC; for urban population, before 1958 adopted from Chen (1959:277), 1972-1980 from Tsai (1982b:214) and 1985 from Taiwan-Fukien Demographic Fact Book using settlements with population over 50,000 as urban population; for non-agricultural population/employment population before 1940 adopted from Hsih (1982:113), after 1972 from Taiwan Statistical Data Book.

Note: Figures in the parentheses indicate Taiwanese Population.

Figure 1: Population Growth, Modernization and Urbanization



$$r_{xy} = 0.79$$
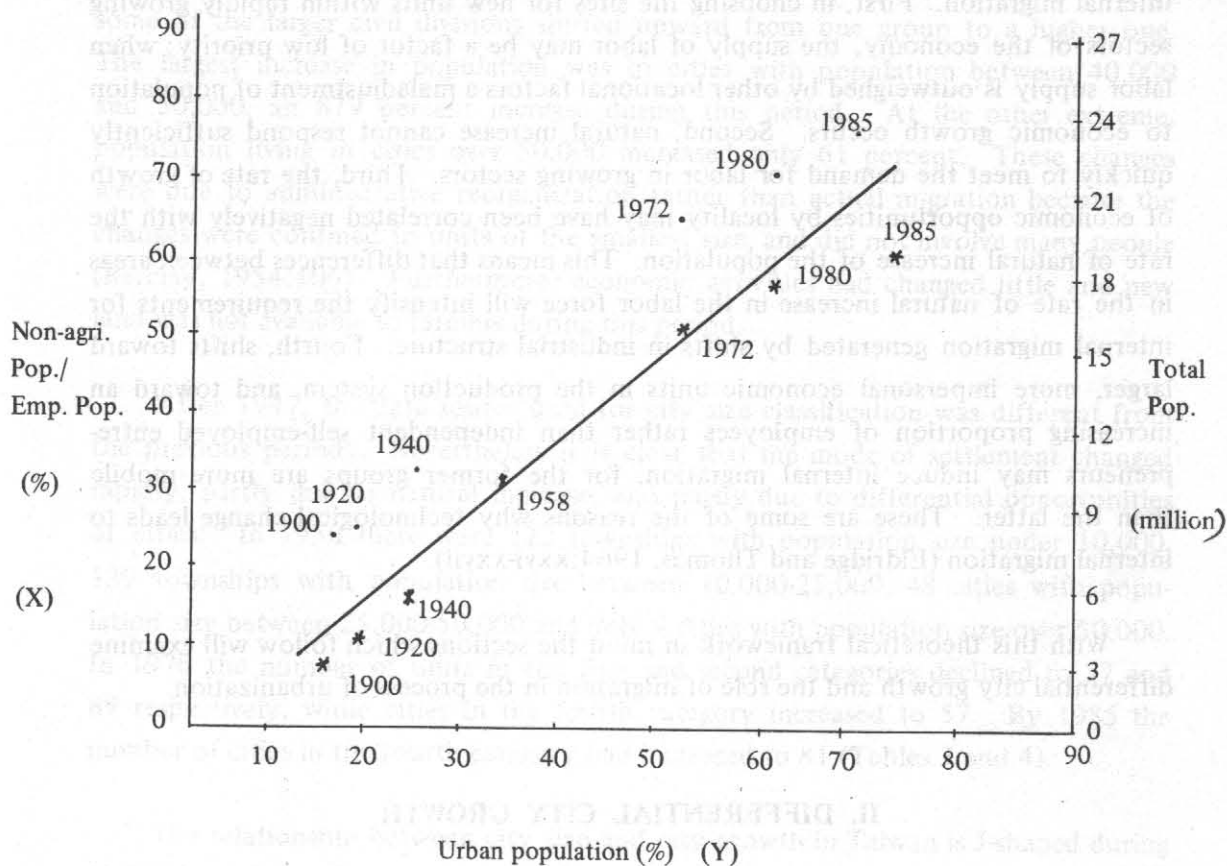
This line of thought was well treated in the study of Population Redistribution and Economic Growth (Lee et al., 1957; Kuznets et al., 1960; Eldridge and Thomas, 1964). Lee and his colleagues argue that the distribution of a country's population is a rough adjustment to the distribution of economic opportunities. This distribution of economic opportunities is altered by technological change, for differential changing rates impact upon different sectors of the country. But the vital processes of birth and death can play only minor roles in adjusting the distribution of population to economic opportunities in the short run. It is migration that must provide the main mechanism of adjustment, and it is migration that accounts for most of the population redistribution that can be viewed as an effect of economic growth (Lee et al., 1957:2).

Four aspects of the shifts in productive structure are of particular relevance to internal migration. First, in choosing the sites for new units within rapidly growing sectors of the economy, the supply of labor may be a factor of low priority; when labor supply is outweighed by other locational factors a maladjustment of population to economic growth occurs. Second, natural increase cannot respond sufficiently quickly to meet the demand for labor in growing sectors. Third, the rate of growth of economic opportunities by locality may have been correlated negatively with the rate of natural increase of the population. This means that differences between areas in the rate of natural increase in the labor force will intensify the requirements for internal migration generated by shifts in industrial structure. Fourth, shifts toward larger, more impersonal economic units in the production system, and toward an increasing proportion of employees rather than independent self-employed entrepreneurs may induce internal migration, for the former groups are more mobile than the latter. These are some of the reasons why technological change leads to internal migration (Eldridge and Thomas, 1964:xxvi-xxvii).

With this theoretical framework in mind the sections which follow will examine differential city growth and the role of migration in the process of urbanization.

## II. DIFFERENTIAL CITY GROWTH

Cities have been the cradles of civilization, progress, and innovation. They offer better educational facilities, superior job opportunities and information, wider contacts, and other service benefits. Potential migrants may be attracted to these centers.

As indicated in the last section, in 1900 there were about 401,000 people living in cities of 2,500 or more. By 1980 nearly 11 million people were living in cities of 20,000 or more, more than 27 times the earlier figure.[2]

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(2) According to Chen (1959:277) of the 400,536 city residents in 1900, 117,442 were living in two cities with population over 25,000 and 283,094 were living in rural townships with population between 2,500 and 25,000. Data for 1980 urban population were calculated from Tsai (1982b:214), using 20,000 as cutting point for urban place instead of 25,000.

Table 2 shows differential rates of growth for different places. Although the total population increased 41 percent from 1920 to 1935 the mode of settlement made little difference. More than two-thirds of the total population were living in places of less than 20,000 at both dates. Because of the general population increase, some of the larger civil divisions shifted upward from one group to a higher one. The largest increase in population was in cities with population between 40,000 and 50,000, an 879 percent increase during this period. At the other extreme, population living in cities over 50,000 increased only 61 percent. These changes were due to administrative reorganization rather than actual migration because the changes were confined to units of the smallest size, and did not involve many people (Barclay, 1954:106). Furthermore, economic activities had changed little and new land was not available to farmers during this period.

After 1947, the data source used for city size classification was different from the previous periods. Nevertheless it is clear that the mode of settlement changed rapidly, partly due to natural increase, and partly due to differential opportunities of cities. In 1950 there were 122 townships with population size under 10,000, 139 townships with population size between 10,000-25,000, 48 cities with population size between 25,000-50,000 and only 9 cities with population size over 50,000. In 1970 the number of units in the first and second categories declined to 37 and 89 respectively, while cities in the fourth category increased to 57. By 1985 the number of cities in the fourth category had increased to 81 (Tables 3 and 4).

The relationship between city size and city growth in Taiwan is J-shaped during 1920-35 period. Cities under 10,000 were growing at an average rate of 4.2% annually. In the size class between 10,000 and 40,000, the average growth rate was lower at 2.3%. Cities with population between 40,000 and 50,000 had the highest rate of population increase, 58.6% annually. This is somewhat different from Preston's observation (1979) of the city growth of the developing countries in which a U-shaped relationship was found. The pattern of city growth was not consistent from period to period. It was reverse U-shaped for the 1950-60 period, upward-wave-shaped for the 1960-70 period, and J-shaped for the 1970-85 period. If a longer period (e.g., 1947-85) was observed, then it became upward-wave-shaped again. It is quite clear that there is no simple relationship between city size and city growth.

Table 2: Total Population by Size of Civil Division, 1920 and 1935 Excluding the Aborigine Territory

| Size of Civil Division | 1920 Population | Civil Division | 1935 Population | Civil Division | Annual* rate of change (%) | Period* growth rate (%) |
|---|---|---|---|---|---|---|
| **A. Number** | | | | | | |
| under 10,000 | 765,772 | 116 | 1,244,749 | 130 | 4.2 | 62.6 |
| 10,000-20,000 | 1,980,510 | 141 | 2,262,691 | 118 | 1.0 | 14.3 |
| 20,000-30,000 | 409,149 | 19 | 606,831 | 22 | 3.2 | 48.3 |
| 30,000-40,000 | 166,543 | 5 | 119,785 | 3 | −1.9 | −28.1 |
| 40,000-50,000 | 47,921 | 1 | 469,151 | 7 | 58.6 | 879.0 |
| over 50,000 | 239,342 | 2 | 384,973 | 2 | 4.1 | 60.9 |
| Total Island | 3,609,237 | 284 | 5,088,180 | 282 | 2.7 | 41.0 |
| **B. Percent** | | | | | | |
| under 10,000 | 21.2 | 40.8 | 24.5 | 46.1 | | |
| 10,000-20,000 | 54.9 | 49.6 | 44.5 | 41.8 | | |
| 20,000-30,000 | 11.4 | 6.7 | 11.9 | 7.8 | | |
| 30,000-40,000 | 4.6 | 1.8 | 2.3 | 1.1 | | |
| 40,000-50,000 | 1.3 | 0.4 | 9.2 | 2.5 | | |
| over 50,000 | 6.6 | 0.7 | 7.6 | 0.7 | | |
| Total Island | 100.0 | 100.0 | 100.0 | 100.0 | | |

Source: Barclay (1954:105).
*recalculated from the data for 1920 and 1935.

Table 3: Number of Cities in Taiwan, by Population Size, 1947-1985

| Year<br>Pop. size<br>(1,000) | 1947 | 1950 | 1960 | 1970 | 1980 | 1985 |
|---|---|---|---|---|---|---|
| A. Number | | | | | | |
| under 10 | N.A. | 122 | 46 | 37 | — | — |
| 10-25 | N.A. | 139 | 124 | 89 | (132)* | (127)* |
| 25-50 | 32 | 48 | 118 | 135 | 116 | 110 |
| 50-100 | 2 | 2 | 21 | 43 | 49 | 56 |
| 100-250 | 6 | 6 | 5 | 9 | 13 | 14 |
| 250-500 | 1 | — | 3 | 3 | 4 | 7 |
| 500-1000 | — | 1 | 1 | 1 | 2 | 2 |
| over 1000 | — | — | — | 1 | 2 | 2 |
| over 25 | 41 | 57 | 148 | 192 | 186 | 191 |
| over 50 | 0 | 9 | 30 | 57 | 70 | 81 |
| B. Percent | | | | | | |
| under 10 | N.A. | 38.4 | 14.5 | 11.6 | — | — |
| 10-25 | N.A. | 43.7 | 39.0 | 28.0 | (41.5)* | (39.9)* |
| 25-50 | 10.1 | 15.1 | 37.1 | 42.5 | 36.5 | 34.6 |
| 50-100 | 0.6 | 0.6 | 6.6 | 13.5 | 15.4 | 17.6 |
| 100-250 | 1.9 | 1.9 | 1.6 | 2.8 | 4.1 | 4.4 |
| 250-500 | 0.3 | 0.3 | 0.9 | 0.9 | 1.3 | 2.2 |
| 500-1000 | — | — | — | 0.3 | 0.6 | 0.6 |
| over 1000 | — | — | 0.3 | 0.3 | 0.3 | 0.6 |
| over 25 | 12.9 | 17.9 | 46.5 | 60.4 | 58.5 | 60.1 |
| over 50 | 2.8 | 2.8 | 9.4 | 17.9 | 22.0 | 25.5 |

Source: Date before 1970 were adopted from Tang (1981:2); after 1980 calculated from 1980 and 1985 Taiwan-Fukien Demographic Fact Book.

N.A.: data not available

* figures in the parentheses indicate population size under 25,000.

Table 4: Urban Population by Civil Division, 1947-1985

unit: thousand

| Year / Pop. size (1,000) | 1947 | 1950 | 1960 | 1970 | 1980 | 1985 | Annual rate of change (%) | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1950–1960 | 1960–1970 | 1970–1985 |
| | | | | A. Number | | | | | |
| 25-50 | 1,079 | 1,709 | 4,077 | 4,876 | 4,904 | 3,961 | 13.9 | 2.0 | −1.3 |
| 50-100 | 162 | 146 | 1,288 | 2,789 | 3,266 | 3,961 | 78.2 | 11.7 | 2.5 |
| 100-250 | 851 | 1,057 | 793 | 1,438 | 2,207 | 2,312 | −2.5 | 8.1 | 4.1 |
| 250-500 | 327 | − | 1,103 | 1,247 | 1,589 | 2,335 | − | 1.3 | 5.8 |
| 500-1000 | − | 616 | − | 828 | 1,177 | 1,315 | − | − | 3.9 |
| over 1000 | − | − | 1,097 | 1,770 | 3,422 | 3,810 | − | 6.1 | 7.7 |
| over 25 | 2,148 | 3,527 | 8,357 | 12,947 | 16,566 | 17,551 | 13.7 | 5.5 | 2.4 |
| over 50 | 1,339 | 1,818 | 4,280 | 8,071 | 11,662 | 13,590 | 13.5 | 8.9 | 4.6 |
| | | | | B. Percent | | | Annual rate of change (%) 1947-1985 | | |
| 25-50 | 16.6 | 22.6 | 37.8 | 33.2 | 29.6 | 22.6 | 7.0 | | |
| 50-100 | 2.5 | 1.9 | 11.9 | 19.0 | 19.7 | 21.8 | 61.7 | | |
| 100-250 | 13.1 | 14.0 | 7.4 | 9.8 | 13.3 | 13.2 | 4.5 | | |
| 250-500 | 5.0 | − | 10.2 | 8.5 | 9.6 | 13.3 | 16.2 | | |
| 500-1000 | − | 8.2 | − | 5.6 | 7.1 | 7.5 | 3.2 | | |
| over 1000 | − | − | 10.2 | 12.6 | 20.7 | 21.7 | 9.8 | | |
| over 25 | 37.2 | 46.7 | 77.4 | 88.2 | 93.0 | 91.1 | 18.9 | | |
| over 50 | 20.6 | 24.1 | 39.7 | 55.0 | 65.5 | 70.6 | 24.1 | | |

Source: Data before 1970 were adopted from Tang (1981:2); after 1980 calculated from 1980 and 1985 Taiwan-Fukien Demographic Fact Book.

This relationship is affected by stage of development, it also appears to be affected by duration of observation. Generally, the longer the interval observed, and the later the period analyzed, the more the upward-wave-shape holds for the relationship. This overall relationship was also documented by many studies which concluded that as development went on the city growth pattern in Taiwan gradually corresponded to the rank-size rule (Chang, 1986; Sun, 1985; CEPD, 1984; 1985).

Another one of the concerns of the present paper is whether the population became more concentrated or more dispersed in the process of city growth over such a long period of time. Table 5 shows the Gibbs-Martin Index and the Gini Concentration Ratio, for the population distribution in Taiwan from 1900 to 1985. Although the definition of a city and the size classification of cities were different for the various indices calculated, the results were rather consistent at each time point observed. The Gibbs-Martin Index gradually declined from 1905 to 1930 and it increased again after 1930 with the later period toward 1980 having higher rate of increase (Shih, 1982:35). This indicates frist a dispersion process followed by a concentration process for the geographic distribution population between 1905 to 1980.

This pattern of population change was closely related to national development policy and the existence of economic opportunities in different places. When a place began to expand its economic base, it would attract people to move in. Thus a concentration process would appear. On the other hand, when a place had developed to a certain extent, it might become too crowded to attract people to move in. Thus the concentration process would slow down or stop. A likely possibility is that people simply move to another growing center; thus overall concentration continues to increase. During her early stage of development when Taiwan was under Japanese. rule a decentralization process occurred because of policy orientation. As observed by Li (1976) in analyzing interprefectural migration from 1920 to 1940, the overall regional pattern of Taiwanese migration was from the populous, developed region to the unpopulous, underdeveloped regions and "a clear regional convergence of population movement was shown" (p.101). The concentration process in later periods was also supported by Wilber (1980); in his analysis of urbanization in Taiwan; he pointed out that in contrast to the argument that absolute deprivation in rural areas is the major cause pushing people to the cities, in Taiwan urban

Table 5: Gibbs-Martin Index and Gini Concentration Ratio of Population
Distribution in Taiwan, 1900-1985

| Year | GMI | GCR | GC |
|------|------|------|------|
| 1900 | – | – | .8428 |
| 1905 | .4113 | – | – |
| 1910 | .4082 | – | – |
| 1915 | .4016 | – | – |
| 1920 | .3980 | – | .6539 |
| 1925 | .3956 | – | – |
| 1930 | .3927 | – | – |
| 1935 | .3968 | – | – |
| 1939 | .4063 | – | – |
| 1940 | – | – | .7736 |
| 1947 | – | .2742 | – |
| 1950 | – | .4033 | – |
| 1952 | .4195 | – | – |
| 1955 | .4291 | .4218 | – |
| 1958 | – | – | .5578 |
| 1960 | .4459 | .4227 | – |
| 1965 | .4676 | .4312 | – |
| 1970 | .5043 | .4428 | – |
| 1972 | – | – | .6325 |
| 1975 | .5653 | .4379 | – |
| 1978 | – | .4259 | – |
| 1980 | .6324 | .5061 | .6201 |
| 1985 | – | .5240 | – |

Source: GMI adopted from Shih (1982:35).
GCR before 1980 were adopted from Tang (1981:21); data after 1980,
were calculated from 1980, 1985 Taiwan-Fukien Demographic Fact Book.
GC before 1958 calculated from Chen (1959), after 1972 from Tsai (1982b:
214), using Formula $Gi = (\sum_{i=1}^{n} X_i Y_{i+1}) - (\sum_{i=1}^{n} X_{i+1} Y_i)$ adopted from Shryock
and Siegel (1973:178), where $X_i$ and $Y_i$ are respective cumulative percentage
distributions and n is the number of class intervals.

economic development was not only able to accomodate the influx but also to hasten city growth.

Another way of understanding differential city growth is to examine their rates of change by administrative classifications. Although the first and the second censuses were conducted as early as 1905 and 1915, no meaningful administrative classification for migration and urbanization studies was available until 1920. In the census of 1920 Taiwan was separated into seven prefectures, namely, Taipei, Hsinchu, Taichung, Tainan, Kaohsiung, Taitung. and Hualien. Under the level of prefectures there were districts and municipalities. Beginning in 1930 Penfu was made independent of Kaohsiung.

In 1920 there were three prefectural cities,[3] namely, Taipei, Taichung, and Tainan. In 1924 Kaohsiung and Keelung became prefectural cities making a total of five such cities. Hsinchu and Chiayi in 1930. Changhwa and Pingtung in 1933, and Ilan and Hualien in 1940 became prefectural cities, making a total of 11 such cities (Chen, 1959: 267-275).

Since 1945, the year of Taiwan's retrocession from the Japanese there have been several reclassifications of city boundaries. Therefore the data used to make comparisons have to be adjusted. However, because the nature of statistics and boundaries of cities varied greatly before and after 1945, it is beyond the scope of this paper to make adjustments over such a long period of time. Therefore one should be very careful in interpreting these long term data.

For simplicity Chen (1959) classified size of city into three ranks: small cities with population size between 25,000-100,000; middle cities with population between 100,000-500,000, and large cities with population over 500,000. According to this scheme, Taiwan had only two small cities in 1900, namely Taipei and Tainan; in 1920 Taipei became a middle city and Keelung and Taichung became small cities; and in 1940 Kaohsiung and Tainan became middle cities, and Chiayi, Hsinchu, and Changhwa became small cities. In 1958, Taipei became large city with 715,000 population. Keelung and Taichung became middle cities and 14 small cities entered, including Hualien and Taitung. In total there were one large city, four middle cities

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(3) Cities with population size over 50,000 were defined as prefectural cities.

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and 17 small cities in 1958 (Chen, 1959:267-275). In 1970 there were 2 large cities, 12 middle cities and 178 small cities. In 1985 12 small cities became middle cities, thus making a total of four large cities, 21 middle cities and 166 small cities.[4]

Table 6 shows four patterns of city population change during five intervals of 1900-20, 1920-40, 1940-60, 1972-80, and 1980-85. The first pattern is characterized by high growth rates through all five periods. Kaohsiung and Taichung belong to this category. The second one had above average increases during early periods and then the growth rate declined to below the average. Hualien, Taitung and Keelung belong to this category. The third one is characterized by low growth rates through most of the periods. Chiayi, Hsinchu and Tainan belong to this category. The fourth pattern is one of fluctuating growth during the periods. Taipei belongs to this category.

This set of patterns implies that population increase is highly related to stage of development. Tainan was the earliest place of development on Taiwan by 1900. Its development had completed; thus had the lower rate of growth. Whereas Hualien and Taitung, the latest places of development, had the higher rate of increase before 1940. However, we should keep in mind that the highest rate of increase does not necessarily mean the highest absolute size of population increase since the original population base may have been very small; even a modest number added to a small base can result in a very high rate of increase. Thus at the end of this period the populations of Hualien and Taitung were still much smaller than those of other cities in Taiwan.

After 1940 the pattern of city growth shifted again. As the economic structure shifted from primary to secondary and tertiary, cities were capable of holding more people than they used to. In addition, the relative disadvantage of primary industry in the rural area made people move to urban centers and their peripheries. The growth rate of Hualien and Taitung declined to below average.

The next section will examine related research in order to understand this changing process.

(4) Data for 1970 were calculated from Tang (1981:2), and for 1985 were calculated from Taiwan-Fukien Demographic Fact Book.

Table 6: Population Growth of Major Cities in Taiwan, 1900-1985

unit: person

| Name of City | 1900 | | 1920 | | 1940 | | 1960 | |
|---|---|---|---|---|---|---|---|---|
| | N | % | N | % | N | % | N | % |
| Taipei | 69,672 | 38.6 | 140,000 | 42.1 | 285,000 | 35.9 | 780,000 | 38.4 |
| Kaohsiung | 4,400 | 2.4 | 21,650 | 6.5 | 108,000 | 13.6 | 335,000 | 16.5 |
| Tainan | 47,770 | 26.4 | 65,700 | 19.7 | 101,000 | 12.7 | 238,000 | 11.7 |
| Taichung | 6,040 | 3.3 | 25,000 | 7.7 | 62,500 | 7.9 | 207,000 | 10.2 |
| Keelung | 12,160 | 6.7 | 27,000 | 8.1 | 92,500 | 11.7 | 189,700 | 9.3 |
| Hsinchu | 19,480 | 10.8 | 21,000 | 6.3 | 45,000 | 5.7 | 113,000 | 5.6 |
| Hualien | 440 | 0.2 | 5,500 | 1.7 | 21,000 | 2.6 | 32,500 | 1.6 |
| Taitung | 1,700 | 0.9 | 3,160 | 0.9 | 11,400 | 1.4 | 30,400 | 1.5 |
| Chiayi | 19,040 | 10.5 | 23,800 | 7.2 | 66,500 | 8.4 | 105,000 | 5.2 |
| Total | 180,702 | 100.0 | 332,810 | 100.0 | 792,900 | 100.0 | 2,030,600 | 100.0 |

| | Rate of Change (%) | | | | | |
|---|---|---|---|---|---|---|
| | 1900-20 | | 1920-40 | | 1940-60 | |
| | a | b | a | b | a | b |
| Taipei | 100.9 | 5.0 | 103.6 | 5.2 | 173.7 | 8.7 |
| Kaohsiung | 392.0 | 19.6 | 398.8 | 19.9 | 210.2 | 10.5 |
| Tainan | 37.5 | 1.9 | 53.7 | 2.7 | 135.6 | 6.8 |
| Taichung | 313.9 | 15.7 | 150.0 | 7.5 | 231.2 | 11.6 |
| Keelung | 122.0 | 6.1 | 242.6 | 12.1 | 105.1 | 5.3 |
| Hsinchu | 7.8 | 0.4 | 114.3 | 5.7 | 151.1 | 7.6 |
| Hualien | 1150.0 | 57.5 | 281.8 | 14.1 | 54.8 | 2.7 |
| Taitung | 85.9 | 4.3 | 260.8 | 13.0 | 166.7 | 8.3 |
| Chiayi | 25.0 | 1.3 | 179.4 | 9.0 | 57.9 | 2.9 |
| Total | 84.2 | 4.2 | 138.2 | 6.9 | 156.1 | 7.8 |

Note: Before 1960 the population of Taipei City only included three districts, namely, Tsung Nai ( 城內), Mong Chia ( 艋舺 ), and Ta Tao Tsung ( 大稻埕 ). a: period growth rate (%), b: annual rate of change (%)

Table 6: Population Growth of Major Cities in Taiwan, 1900-1985 (continued)

unit: person

| | 1972 | | 1980 | | 1985 | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| Taipei | 1,890,760 | 40.5 | 2,202,704 | 40.0 | 2,498,593 | 43.9 |
| Kaohsiung | 937,015 | 20.1 | 1,194,637 | 21.7 | 1,250,605 | 21.9 |
| Tainan | 457,923 | 9.8 | 528,419 | 9.6 | 601,687 | 10.6 |
| Taichung | 450,221 | 9.7 | 556,163 | 10.1 | 641,054 | 11.3 |
| Keelung | 317,354 | 6.8 | 341,923 | 6.2 | 316,336 | 5.6 |
| Hsinchu | 220,950 | 4.7 | 272,350 | 4.9 | 260,567 | 4.6 |
| Hualien | 92,733 | 2.0 | 102,572 | 1.9 | 102,316 | 1.8 |
| Taitung | 65,133 | 1.4 | 70,971 | 1.3 | 73,830 | 1.3 |
| Chiayi | 230,923 | 5.0 | 242,417 | 4.4 | 237,699 | 4.2 |
| Total | 4,663,012 | 100.00 | 5,512,156 | 100.0 | 5,697,987 | 100.0 |

| | Rate of Change (%) | | | |
|---|---|---|---|---|
| | 1972-1980 | | 1980-1985 | |
| | a | b | a | b |
| Taipei | 16.5 | 2.1 | 13.4 | 2.7 |
| Kaohsiung | 27.5 | 3.4 | 4.7 | 0.9 |
| Tainan | 15.4 | 1.9 | 13.9 | 2.7 |
| Taichung | 23.5 | 2.9 | 15.3 | 3.1 |
| Keelung | 7.7 | 1.0 | − 7.5 | −1.5 |
| Hsinchu | 23.3 | 2.9 | − 4.3 | −0.9 |
| Hualien | 10.6 | 1.3 | − 0.2 | −0.0 |
| Taitung | 9.0 | 1.1 | 4.0 | 0.8 |
| Chiayi | 5.0 | 0.6 | − 1.9 | −0.4 |
| Total | 18.2 | 2.3 | 3.4 | 0.7 |

Source: Data before 1960 adopted from Chen (1962:5); data after 1972 were adjusted to the administrative classification of 1985. Figures for 1972 and 1980 were adjusted from Tsai (1982b:234-241), and for 1985 were calculated from Taiwan-Fukien Demographic Fact Book and Household Statistics for Individual Villages.

## III. MIGRATION AND CITY GROWTH

The relationship between migration and city growth is similar to that of migration and population growth. When a place experiences rapid urbanization, it implies that the rapid expansion of the socioeconomic base has attracted more people to move in. However, when it grows to a certain limit, it may become too crowded to attract people to move in. In early days when Taiwan was under Japanese rule the data available for the analysis of this relationship covered only a short period of time, i.e., 1920-40.

Analyzing 1920-1935 census data Barclay (1954:107-111) found that: (1) the migrant population was small; (2) settlement was beginning and growing rapidly in the eastern coast region, although not involving a large number of people, through government design and encouragement by private companies; (3) much of the movement covered only short distances from one civil division to the next; (4) net migration accounted for most of the variation in population change from one civil division to another; and (5) city populations gained the most from migration. Very few Taiwanese shifted residence across prefectural boundaries, even fewer than those who moved across district boundaries.

During this early stage, the proportion urban was very small as shown in the first part of this paper, and natural increase did not contribute differentially to regional population growth. Therefore, we can confidently infer that the differential city growth during 1920-40 period was primarily due to migration.

This inference seems contradictory to the argument which has been accepted by many scholars in distinguishing urban growth and urbanization. The former refers to an increase in the size of the urban population while the latter refers to an increase in the proportion of the population living in urban places (Davis, 1972: 47-48; Goldscheider, 1983: 10-11; United Nations, 1980: 34). According to these authors urban growth is mainly attributable to high natural increase; urbanization is mainly attributable to rural-to-urban population transfers. In fact, the contradiction is due to the use of different terminology rather than representing a real difference. When a society is in its early stages of development, almost the whole society is rural; even though there is some urban population, urban settlements are very small. Since natural increase does not have much variation within a socioeconomically homo-

geneous society, any significantly differential rates of population growth among various places must be due to the mechanism of migration.

As pointed out by Speare (1974) "recent net migration in Taiwan can be explained as almost entirely a move from agricultural areas to cities and large urban towns .... Rural-to-urban migration in Taiwan can be viewed as a rational response to changing economic conditions" (pp.318-319).

Since 1945 the urbanization process has accelerated. For example during the 1951-85 period, the total population in Taiwan increased from 7.8 million to 19 million, a 143% increase or 2.6% annual increase, similar to the rate of natural increase in the period; during the same period the population of the five largest cities (Keelung, Taipei, Taichung, Tainan, and Kaohsiung) increased from 1.6 million to 5.4 million, a 3.6% annual increase, or 1.0% higher than that of the total population. In the simplest arithmetic sense, if we assume that the natural increase of the urban population was equal to that of the rest of the population (actually it is lower), then there was an increase of 3.0 million people in the five cities due to rural-urban migration (Table 7), an average of 100,000 net migration from rural places to the five big cities per year.

Although migration and city growth are highly related, the volume of migration fluctuated with socio-economic opportunities. Taking Taipei and Kaohsiung cities as examples, beginning from 1951, for four sequential quinquennial intervals, many opportunities were created in these two cities. As a result there was a significant proportion of social increase during these periods, especially during the 1966-71 period. Social increase had a higher weight than natural increase in contributing to the population growth of Taipei and Kaohsiung. After that period, because of the expansion of business in the peripheries of the cities and over congestion of the city centers, the rate of social increase slowed down, so natural increase became more important than social increase in contributing to the population growth of the two cities (Table 8).

Table 9 shows that the population of the old city district of Taipei declined about 12.2% from 1956 to 1976; in the same period the satellite townships had a high rate of population increase, 292.8%,. The trend continued from 1976 to 1985.

Table 7: Population Increase, Taiwan Area and Five Big Cities

| Year | Taiwan Area | Five big cities | Taipei* | Keelung | Taichung | Tainan | Kaohsiung* |
|---|---|---|---|---|---|---|---|
| | | | Population (thousand) | | | | |
| 1951 | 7,869 | 1,582 | 682 | 151 | 204 | 231 | 314 |
| 1956 | 9,390 | 2,046 | 909 | 197 | 249 | 287 | 404 |
| 1961 | 11,149 | 2,579 | 1,150 | 240 | 310 | 350 | 529 |
| 1966 | 12,992 | 3,220 | 1,463 | 287 | 380 | 416 | 674 |
| 1971 | 14,995 | 4,042 | 1,840 | 329 | 467 | 485 | 921 |
| 1976 | 16,508 | 4,611 | 2,089 | 343 | 561 | 537 | 1,081 |
| 1981 | 18,136 | 5,048 | 2,271 | 348 | 607 | 595 | 1,227 |
| 1985 | 19,135 | 5,426 | 2,508 | 352 | 665 | 636 | 1,303 |

| Period | | | | Increase rates (%)** | | | |
|---|---|---|---|---|---|---|---|
| 1951-56 | 19.3 | 29.3 | 33.3 | 30.5 | 22.1 | 24.2 | 28.7 |
| 1956-61 | 18.7 | 26.1 | 26.5 | 21.8 | 24.5 | 22.0 | 30.9 |
| 1961-66 | 16.5 | 24.9 | 27.2 | 19.6 | 22.6 | 18.9 | 27.4 |
| 1966-71 | 15.4 | 25.5 | 25.8 | 14.6 | 22.9 | 16.6 | 36.6 |
| 1971-76 | 10.1 | 14.1 | 13.5 | 4.3 | 20.1 | 10.7 | 17.4 |
| 1976-81 | 9.9 | 9.5 | 8.7 | 1.5 | 8.2 | 10.8 | 13.5 |
| 1981-85 | 5.5 | 7.5 | 10.4 | 1.1 | 9.6 | 6.9 | 6.2 |

Source: Taiwan Demographic Fact Book, Republic of China.

Taiwan-Fukien Demographic Fact Book, Republic of China.

Note : * Administrative classifications were adjusted to the boundaries of 1985 for Taipei and Kaohsiung.

** Increase rates were calculated for each quinquennial interval.

Kaohsiung City had a similar situation. Beginning in 1953 when the first economic development program was enacted, Kaohsiung started to develop its industry. A series of development projects had been undertaken. In 1966 an "Industry Exporting Zone" and a "Sea Shore Industry Area" were completed, and the "Nan Tsu Manufacturing Zone" was completed in 1969. This series of development projects increased job opportunities tremendously, thus attracting a huge volume of migration. Such expansion has given Kaohsiung City the highest rate of population increase in the past two decades.

Table 8: Natural Increase and Social Increase of Taipei City and Kaohsiung City

Unit: thousand

| Year | Taipei | | | | | | Kaohsiung | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Population Increase | | Natural Increase | | Social Increase | | Population Increase | | Natural Increase | | Social Increase | |
| | N | % | N | % | N | % | N | % | N | % | N | % |
| 1951-56 | 229 | 33.4 | 138 | 20.1 | 91 | 13.3 | 90 | 28.6 | 73 | 23.2 | 17 | 5.4 |
| 1956-61 | 240 | 26.5 | 154 | 17.0 | 86 | 9.5 | 125 | 31.0 | 82 | 20.3 | 43 | 10.7 |
| 1961-66 | 311 | 27.2 | 175 | 15.3 | 136 | 11.9 | 145 | 27.5 | 91 | 17.3 | 54 | 10.2 |
| 1966-71 | 377 | 25.8 | 179 | 12.2 | 198 | 13.6 | 247 | 36.5 | 100 | 14.8 | 147 | 21.7 |
| 1971-76 | 249 | 13.5 | 179 | 9.7 | 70 | 3.8 | 160 | 17.4 | 107 | 11.6 | 53 | 5.8 |
| 1976-81 | 182 | 8.7 | 181 | 8.7 | 1 | 0.0 | 146 | 13.5 | 112 | 10.4 | 34 | 3.1 |
| 1981-85 | 236 | 10.4 | 127 | 5.6 | 109 | 4.8 | 75 | 6.1 | 73 | 5.9 | 2 | 0.2 |

Source: The Statistical Abstract of Kaohsiung Municipality.

The Statistical Abstract of Taipei Municipality.

The Statistical Abstract of Taipei County.

The Statistical Abstract of Kaohsiung County.

Note: Data for previous periods were adjusted to current administrative classification.

Table 9: Population Increase for Taipei Metropolitan Area, 1956-1985

| | Population (person) | | | Population Increase | | | |
|---|---|---|---|---|---|---|---|
| | | | | 1956-76 | | 1976-85 | |
| | 1956 | 1976 | 1985 | N | % | N | % |
| I | 246,889 | 216,904 | 172,644 | −29,985 | −12.2 | −44,260 | −20.4 |
| II | 501,621 | 1,278,129 | 1,396,706 | 776,580 | 154.8 | 118,577 | 9.3 |
| III | 159,246 | 594,255 | 938,270 | 435,009 | 273.2 | 344,015 | 57.9 |
| IV | 360,823 | 1,417,346 | 2,308,380 | 1,056,523 | 292.8 | 891,034 | 162.9 |
| Total | 1,268,579 | 3,506,634 | 4,816,000 | 2,238,055 | 176.4 | 1,309,366 | 37.3 |

Source: Data for 1956-1976 period were adopted from Lin (1979:57). Data for 1976-1985 were calculated from Statistical Abstract of Taipei County and Taiwan-Fukien Demographic Fact Book.

Note:   I.   Old city districts include: Lungshan, Chengchung, Chiencheng, Yenping.

II.  Old city peripheries include: Sungshan, Ta-an, Kuting, Shangyuan, Tatung, Chungshan.

III. New city districts include: Neihu, Nankang, Chingmei, Musha, Shihlin, Peitou.

IV. Satellite townships include: Panchiao, Sanchung, Yungho, Chungho, Hsingchung, Hsintien, Shulin, Tanshin, Hsichuh, Tucheng, Wuku, Taishan, Luchou.

Table 10 shows that from 1956 to 1985 the population of Kaohsiung City increased from 397 thousand to 1.3 million, a 228% increase. This increase was largely due to migration. If there had been no migration, Kaohsiung's population could at most only have doubled in the same time period. (The total population of the whole island increased 1.04 times during this period). The fluctuating rates of population increase in Kaohsiung City were strongly related to changing socio-economic opportunities; whenever there was a big development project there was a high rate of population increase. For example, the annual rates of population increase for Kaohsiung City were 5.92% (1953), 6.50% (1959), 6.73% (1960), 6.13% (1966), and 8.79% (1969) respectively (Liao, 1985: 208). Except for 1953, the rates

of increase for Kaohsiung City were higher than those of Taipei City (Liao, 1985:
209).

The geographic distribution of population in Kaohsiung City changed with the
growth of the City's population. In 1956 the population was concentrated in the
city center. There was a positive relationship between population density and dis-
tance from the city center; the nearer the place to the city center, the higher was
the population density, and vice versa. By 1979 this relationship had turned around.
The peripheries had both higher population density and higher rates of population
increase. In 1956 the city center had 31.8% of the total city population, the inner
city had 26.0%, and the peripheries had 42.2%; but by 1979, the percentage had
shifted to 14.9%, 27.2% and 58.0% respectively. The rates of population increase
for these three different zones during this 30 year period were 29%, 239%, and 371%.
These clearly show the relative population decline of city center and the rapid in-
crease of outer zones. This rapid change in geographic distribution was mainly caused
by migration instead of differential natural increase. The trend slowed down during
the 1979-1985 period (Table 10).

The movement of population in the Kaohsiung metropolitan area shows the
interaction of concentration and decentralization. On the one hand people from far
remote areas were attracted to the surroundings of the city, on the other hand, people
moved from the city center toward the periphery. From 1965 to 1974 there were
about 20,000 net migrants annually. For example in 1969, there were 62,849 in-
migrants and 38,496 out-migrants, for a net of 24,353 migrants. The number of net
migrants declined gradually after 1975, until 1979 when the volume of net migrants
increased again (Liao, 1985: 209-210). This overall pattern of population change
was also confirmed by a comprehensive study which concluded that in Kaohsiung
City the volume of net-migrants increased with the developmental opportunities and
decreased with the congestion of the city (Hsieh, 1985).

So far the examples provided have shown the close relationship between migra-
tion and urbanization or urban growth. Yet we want to know more about the role
of migration in urban growth. Liu and Speare (1973:165) found that migration to
the city is one adaptation to rapid industrialization. Although a large portion of the
labor force transfered from agriculture to industry, the transfer took place in rural
areas, and represented merely a change of working place rather than a change of

Table 10: Population Distribution of Kaohsiung City

| | Population | | | Pop. Increase |
| | 1956 | 1979 | 1985 | 1956-1985 |
|---|---|---|---|---|
| | N      %  | N      % | N      % | % |
| City center | 126,208(31.8) | 174,405(14.9) | 163,256(12.5) | |
| Yenchen | 55,142 | 45,238 | 41,178 | |
| Chienchin | 34,100 | 48,051 | 44,488 | 29.4 |
| Hsinhsing | 36,933 | 81,116 | 77,590 | |
| Inner city | 103,215(26.0) | 318,565(27.2) | 350,064(26.9) | |
| Linya | 29,619 | 182,379 | 210,977 | 239.2 |
| Chiching | 19,818 | 36,899 | 34,772 | |
| Kushan | 53,778 | 99,287 | 104,318 | |
| Peripheries | 167,734(42.2) | 680,007(58.0) | 789,529(60.6) | |
| Chienchen | 31,025 | 193,062 | 200,748 | |
| Sanmin | 30,528 | 220,301 | 278,327 | |
| Tsoying | 50,710 | 111,609 | 106,559 | 370.7 |
| Nantzu | 23,473 | 78,719 | 101,981 | |
| Hsiaokang* | 31,998 | 76,316 | 101,914 | |
| Total | 397,157 | 1,172,977 | 1,302,849 | 228.0 |

Source: Data calculated from The Statistical Abstract of Kaohsiung City, and The Statistical Abstract of Kaohsiung County.

Note: All the data compared were adjusted to the current administrative boundaries.

*Hsiaokang was incorporated into Kaohsiung City in 1979.

residence. Using national data for the 1960-80 period, Tsai (1984) decomposed urban growth into four factors (natural increase, net migration, reclassification of urban area, and the addition of new cities – Table 11), and concluded that natural increase is the major factor contributing to urban growth, accounting for about one-half of the growth. One-third of urban growth was due to the addition of new cities, and net migration accounted for one-quarter; the reclassification of city boundaries had the least effect. The contribution of net migration to urban growth varied in

different time periods. For example, in 1970-1975 period, net migration contributed 36.30% to city growth, but in the period a decade earlier, it accounted for only 17.51% of urban growth.

Another study by Tsai(1982a: 9-25) concluded that net migration contributed about 51% of the population increase of Taipei City from 1968 to 1973, while natural increase contributed 49%. Tsai further differentiated the natural increase into two parts, one from the original residents and the other from the migrants, and concluded that the population increase of Taipei City was primarily due to migration. Migrants and their natural increase accounted for 82% of the total population increase while the natural increase of the original residents accounted for only 12%.

Table 11: The Factor of Urban Growth for Taiwan Area

unit: thousand

|         | Population Increase | New Cities | Reclassification of Urban Area | Natural Increase | Net Migration |
|---------|--------------------|-----------|-------------------------------|-----------------|--------------|
| 1960 N  | 1,610              | 551       | 0                             | 777             | 282          |
| 1965 %  | 100.00             | 34.22     | 0.00                          | 48.27           | 17.51        |
| 1965 N  | 2,197              | 677       | 0                             | 863             | 657          |
| 1970 %  | 100.00             | 30.81     | 0.00                          | 39.29           | 29.90        |
| 1970 N  | 1,449              | 235       | -160                          | 848             | 526          |
| 1975 %  | 100.00             | 16.22     | -11.04                        | 58.52           | 36.30        |
| 1975 N  | 2,201              | 642       | 0                             | 1,075           | 484          |
| 1980 %  | 100.00             | 29.17     | 0.00                          | 48.85           | 21.98        |

Source: H. H. Tsai, 1984.

Table 12: Annual Component Change of Labor Force, 1971-1981

Unit: %

| | | High | | | Middle | | | Low | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Total | Male | Female | Total | Male | Female | Total | Male | Female |
| | Natural increase | 3.48 | 3.45 | 3.54 | 3.32 | 3.29 | 3.38 | 2.68 | 2.73 | 2.56 |
| 1971 | Net migration | −2.28 | −2.00 | −2.85 | −0.79 | −0.63 | −1.12 | 0.85 | 0.71 | 1.23 |
| 1976 | Change of activity rate | 1.19 | 0.08 | 3.44 | 1.25 | 0.23 | 3.37 | 2.01 | 0.51 | 5.96 |
| | Net change | 2.38 | 1.53 | 4.12 | 3.78 | 2.88 | 5.62 | 5.60 | 3.95 | 9.95 |
| | Natural increase | 3.01 | 3.02 | 3.00 | 2.89 | 2.86 | 2.96 | 2.50 | 2.58 | 2.34 |
| 1976 | Net migration | −2.19 | −2.04 | −2.49 | −1.61 | −1.94 | −0.97 | 0.90 | 0.78 | 1.15 |
| 1981 | Change of activity rate | 0.60 | 0.13 | 1.51 | 0.37 | 0.26 | 0.58 | 1.16 | 0.09 | 3.41 |
| | Net change | 1.42 | 1.11 | 2.02 | 1.65 | 1.17 | 2.56 | 4.56 | 3.45 | 6.89 |

Source: 1. Date for 1971-1976 were adopted from Liao, C. H. & M. C. Liao (1979: 119-151).

2. Data for 1976-1981 computed from Taiwan-Fukien Demographic Fact Book, Republic of China.

The other approach to explore this relationship is to compare the change in labor force in rural and urban areas. Change in labor force was decomposed into three components: natural increase, net migration, and change of activity rates. Natural increase was defined as total number of new entries minus the mortality and retirement of the labor force. Change of activity rates means the change in labor force participation was due to changes in economic structure or job opportunities. Table 12 shows the results of this analysis for three areas urban, middle rural, and high agricultural. Both in the 1971-76 and 1976-81 periods, among the three areas, the urban areas had the highest rates of labor force increase, and the high agricultural area had the lowest. Of the factors contributing to labor force increase, high agricultural areas had the highest rates of natural increase, while urban areas has the least. On the other hand only urban areas had net-inmigration, while middle rural and high agricultural areas all experienced net out-migration. As for the activity effect, urban areas had the strongest of activity effect, middle rural areas were next, and high agricultural area were the least (Liao, 1985).

## IV. SUMMARY AND CONCLUSION

This paper has reviewed previous research and statistical data concerning urbanization and its relationship to migration in Taiwan since 1905 when the first census was taken under Japanese rule. Due to frequent changes of administrative and city boundaries and the lack of availability of ideal data, to make the comparison more objective the discussion of urbanization and migration was roughly separated into two periods, i.e., before and after 1945 (the year of Taiwan's retrocession from Japan).

The level of urbanization was very low when Taiwan was under Japanese rule. The proportion urban increased from 14.07% in 1900 to 24.68% in 1940, only 10.61% increase. The low level of industrialization and the difficulty of communication and transportation in the early stage of development may have impeded migration. Beginning in 1953, after her recovery, Taiwan began a series of economic construction plans. Modern industries have been burgeoning in many big cities and their peripherial townships, thus accelerating the urbanization process. Accordingly, the proportion urban rose from 24.7% in 1953, the year the first "Four-Year Economic Development Plan" to 61.6% in 1980, a 36.9% increase.

The total population of Taiwan increased from 3,039,751 in 1905 to 19,258,053 in 1985, a 576.7% increase; in the same time period, the urban population increased from 400,536 to 10,975,595, a 2640.2% increase, much faster than total population growth. The data also clearly show that the growth rate of the urban population has been much faster than the rate of change in the proportion that is urban.

During the 1920-40 period the population of Taiwan gradually moved from places of early settlement to new city centers or newly developed areas. As early as 1955 Davis observed a strong tendency of cities to expand outward in most parts of the world. As time goes on, within the metropolitan area the greater the distance from the center of the city, the faster the rate of growth (Davis, 1955). City growth in Taiwan confirms this observation. For example, Taipei, the biggest city in Taiwan, has such a tendency. It is quite clear that the process of metropolitan dispersion has increased with the development of urbanization in Taiwan.

From 1945 to 1985 the peripheries of big cities such as Taipei and Kaohsiung were gaining population through net migration. All the evidence indicates that this represented the movement of people toward opportunities, which indirectly supports the relationship between migration and urbanization.

Many scholars maintain that urban growth in developing countries results primarily from the natural increase of urban population (Davis, 1965; Arriaga, 1968; Findley, 1977; United Nations, 1980). However, judging from the rapid urban growth in Taiwan during the 1953-85 period, and considering the natural increase contributed by migrants in urban areas, it is likely that, as pointed out by Preston (1979: 199), rural-urban migration is a more important source of urban growth.

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# 台灣之都市化：1900—1985

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### （中文摘要）

　　本研究檢討有關都市化之相關研究及統計資料藉以澄清台灣地區自 1900-1985 年間都市化之情形及其與人口遷移之關係。台灣在日據時代都市化的程度很低，而且在開發初期工業不發達、交通不便阻礙了人口遷移。自 1953 年開始一系列的經建計劃之後許多新興工業設於大都市及其週圍之市鎮，因而加速都市化之過程。本研究發現台灣都市成長的模式各階段並不一致，在 1950-60 年代是倒 U 字型，1960-70 年代是向上波動型，1970-85 年代是 J 字型。假若觀察的時間較長（如 1947-85 年間）則呈現向上波動型。都市大小與都市成長並非單向的關係，其間之關係受社會發展的階段及觀察時間長短的影響。一般而言觀察時期越長，且越是晚近的資料則都市大小與都市成長呈現向上波動的關係。本研究資料顯示都市人口增加的速度遠比都市化比例改變的速度快。

　　在 1920 到 1940 年代期間，台灣地區的人口逐漸由早期墾殖地移至新開發地區，在都市化的速度中亦伴隨著大都會人口之分散。許多學者認為開發中國家都市人口之成長主要是因自然增加的結果，但是台灣地區都市人口之增加，鄉村人口之移入更具影響力。

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# URBANIZATION IN TAIWAN: 1900-1985

## (ABSTRACT)

This paper has reviewed previous research and statistical data concerning urbanization and its relationship to migration in Taiwan during 1900-1985 period. The level of urbanization was very low when Taiwan was under Japanese rule. The low level of industrialization and the difficulty of communication and transportation in the early stage of development may have impeded migration. Beginning in 1953, Taiwan began a series of economic construction plans. Modern industries have been burgeoning in many big cities and their peripherial townships, thus accelerating the urbanization process. The data clearly show that the growth rate of the urban population has been much faster than the rate of change in the proportion that is urban. During the 1920-40 period the population of Taiwan gradually moved from places of early settlement to new city centers or newly developed areas. It is quite clear that the process of metropolitan dispersion has increased with the development of urbanization in Taiwan.

The pattern of city growth was not consistent from period to period. It was reverse U-shaped for the 1950-60 period, upward-wave-shaped for the 1960-70 period, and J-shaped for the 1970-85 period. If a longer period (e.g., 1947-85) was observed, then it became upward-wave-shaped again. It is quite clear that there is no simple relationship between city size and city growth. This relationship is affected by stage of development; it also appears to be affected by duration of observation. Generally, the longer the interval observed, and the later the period analyzed, the more the upward-wave-shape holds for the relationship.

Many scholars maintain that urban growth in developing countries results primarily from the natural increase of urban populations. However, judging from the rapid urban growth in Taiwan during the 1953-85 period, and considering the natural increase contributed by migrants in urban areas, it is likely that rural-urban migration is a more important source of urban growth.