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# CHANGES IN LEVEL AND VARIATION IN PERSONAL INCOME IN FLORIDA

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## INTRODUCTION

A question of particular concern in recent years is: what happens to personal income distribution as the average level of income rises? The purpose of this study was to add knowledge to empirical answers to this question by way of estimates of changes in Florida–both within and between regions with different income levels.

Williamson [17] suggests that as significant economic growth first occurs in one region, the absolute income differentials between rich and poor regions are expected to persist or even to increase; but sometime during the course of development, some or all of the disequilibrating tendencies diminish, and the regional differences in incomes decline. Labor migration, capital movements, government policy, geographic size, and labor participation rate were discussed by Williamson as important elements in the exploration of changes over time in incomes among regions [17, pp. 4-10].

Kuznets [6], on the basis of his study of the United States, England, and Germany, stated that, "One might thus assume a long swing in the inequality characterizing the secular income structure: Widening in the early phases of economic growth...; becoming stabilized for awhile, and then narrowing in the later phases" [6, p. 18]. Also, reduction in inequality of income was accompanied by significant rises in real income per capita [6, p. 5]. Briefly, the explanation given by Kuznets was as follows: initially, the higher propensity to save and invest on the part of higher income individuals, compared to lower income persons, would lead to greater income inequality; eventually, political action in the form of progressive income and inheritance taxes, legislation favorable to labor, and other changes would lead to reductions in the inequality of incomes. Level of education has been found to have a positive correlation to income level. Where the higher levels of education have been accompanied by more equal opportunities in education, and in the labor market, this should result in more equal distribution of income.

Additional empirical support of the relationships between level and variation in income, as suggested by Kuznets, was provided by Aigner and Heins [1]. Several other studies have dealt with income level and variation in the farm sector–the studies of Gardner [5], and Elsner and Hoch [4] are examples. Also, several studies have dealt with education and human capital–the work reported by Becker [2] is an example.

Economic growth, measured in terms of sustained increases in real income per capita or per family, arises as a result of increasing incomes within occupations and as a result of shifts in employment of persons from lower to higher income occupations. In developed countries, economic growth generally has been closely associated with industrialization and urbanization. In general, average income is lower in the farm sector than in the other sectors. Also, growth can arise from population shifts among geographic areas. Personal incomes differ among geographic areas as a result of differences in the occupational mix of employment as well as in geographic differences in incomes within occupations.

The objectives of the present study were, with respect to personal income in Florida, to: (a) measure the differences among counties in levels, rates of change, and variability of income; (b) determine the relationship between level and variability of income, and (c) indicate major factors associated with changes

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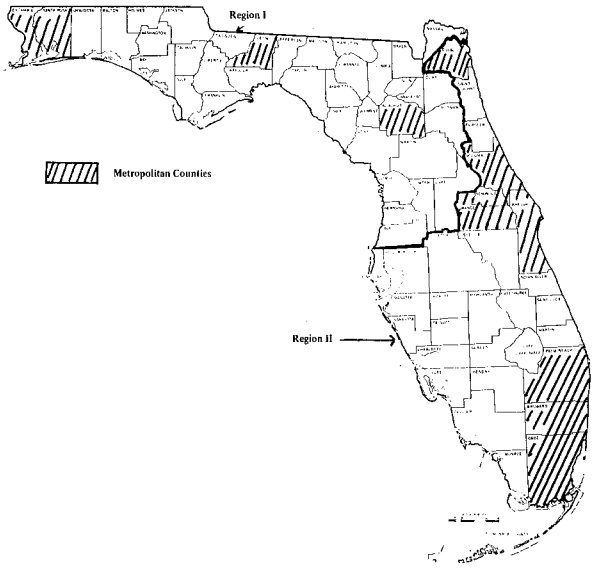


**Figure 1. REGIONS I AND II, AND METROPOLITAN AREAS, FLORIDA**

in the level and variability of income. With respect to (c), the occupational and geographic shifts in population were considered, but the more fundamental question of what caused the changes in level and composition of economic activity was not considered. In most of the analysis, the time period was from 1949 to 1969. In parts of the analysis, counties were grouped into two regions (Fig. 1). There were differences between regions in incomes within occupations, in geographic movements of population, and in other important features (Table 1). The regional grouping of counties was for the purpose of determining the differences, between "rich" and "poor" regions, in income growth rates and degree of inequality as suggested by Williamson [17].

Florida differs from the other southern states in a number of ways that are related to the level and distribution of income. Between 1938 and 1958, it developed a more favorable industry mix (higher proportion of labor employed in the higher growth and income industries) and improved its competitive position within industries (increased efficiency within industries compared to similar industries in other regions) [3, p. 21]. Also, Florida has a relatively large tourist industry that may depend upon levels of incomes in other states, and its in-migration of population, to a larger extent than is true in many other states, consists of retired persons rather than those attracted by employment opportunites. Despite these differences, the empirical results, as well as the analytical techniques used in the present study, may well be of interest outside Florida.

## INCOME LEVELS AND GROWTH RATES

Two sets of income data were used–median family income and per capita income. Both sets were taken from the U.S. Census. "Family" was defined as a group of two or more persons related by blood, marriage, or adoption, and living together. "Income" was defined as the sum of money received from wages or salaries, net income (or loss) from self-employment, and income other than earnings. Income data were converted to 1969 purchasing power by use of the consumer price index (BLS) reported by the U.S. Dept. of Commerce. The absence of adjustments in income for capital gains and other noncash items, income taxes, and differences in cost of living among areas, reduces the accuracy of both the growth rates and the degree of inequality in incomes. A number of these items probably would have opposite effects from one another. For example, capital gains would increase growth rates and degree of inequality, while income taxes would reduce growth rates and degree of inequality.

Incomes have increased in both the urban and the rural sectors and in both geographic regions since 1949 (Table 1). Compound growth rates in income were estimated by using the following equations:

(1) 1949 to 1959- -

$$\bar{Y}_{'59} = (1 + r)^{10} \bar{Y}_{'49} \text{ and}$$

(2) 1959 to 1969- -

$$\bar{Y}_{'69} = (1 + r)^{10} \bar{Y}_{'59}$$

where $\bar{Y}$ = median family income, and $(1 + r)$ = yearly compounding factor.

For the state, annual compound growth rate in median family income was 4.99 percent from 1949 to 1959 and 3.30 percent from 1959 to 1969. While levels of income in the rural sector were below those in the urban sector, the higher growth rates were in the rural sector. Also, income growth rates in Region I, where levels of income were lower, exceeded those in Region II. Thus, income growth rates in the lower level occupations and areas exceeded those in the higher income occupations and areas. Population growth rates were much higher in Region II than in Region I. Thus, an increasing share of the population was moving into the higher income areas and occupations. Growth rates were higher in the 1950's than in the 1960's.

## CHANGES IN INCOME INEQUALITY

Unfortunately, available data were not reported in a form that could be used to measure degree of

**Table 1. INCOME, POPULATION, AND OTHER CHARACTERISTICS BY REGIONS, FLORIDA***

| Item | 1949 | 1959 | 1969 | Change 1949-'59 | Change 1959-'69 |
|---|---|---|---|---|---|
| | dollars | | | percent | |
| Median family income | | | | | |
| State | 3,676 | 5,977 | 8,267 | 62.6 | 38.3 |
| Urban | 4,146 | 6,273 | 8,614 | 51.3 | 37.3 |
| Rural nonfarm | 3,060 | 5,214 | a | 70.4 | a |
| Rural farm | 2,108 | 4,267 | a | 102.4 | a |
| Per capita income | | | | | |
| State | 1,952[b] | 2,449 | 3,394 | 25.5 | 38.6 |
| Region I | 1,434[b] | 1,955 | 2,709 | 36.3 | 37.8 |
| Region II | 2,126[b] | 2,594 | 3,559 | 22.0 | 37.2 |
| Population | 1,000 | | | | |
| State | 2,771[b] | 4,952 | 6,699 | 78.7 | 35.3 |
| Region I | 749[b] | 1,001 | 1,243 | 33.6 | 24.2 |
| Region II | 2,023 | 3,950 | 5,456 | 95.2 | 38.1 |
| Urban/total population | percent | | | | |
| State | 65.4 | 74.0 | 80.6 | | |
| Region I | 36.0 | 45.0 | 51.7 | | |
| Region II | 76.3 | 81.4 | 87.2 | | |
| Employed labor force in agr. | | | | | |
| State | 13.3 | 6.8 | 4.1 | | |
| Region I | 24.2 | 11.6 | 6.8 | | |
| Region II | 9.8 | 5.7 | 3.6 | | |
| Output per unit of labor in agriculture | index | | | | |
| State | 29.7 | 59.3 | 102.0 | | |
| Region I | 23.6 | 48.2 | 94.4 | | |
| Region II | 74.8 | 148.1 | 254.9 | | |

*Source: Median income [11, 12, 13]; state per capita income [16]; regional per capita incomes, from special computer runs made by the Bureau of Economic Analysis, U.S. Dept. of Commerce; population data, supplied by the Bureau of Economic and Business Research, University of Florida. All income was converted to 1969 purchasing power. State and regional per capita income sources were different and not exactly comparable. Agr. index, computed from data in [8, 9, 10, 14, 15]. Labor force in agriculture [11, 12, 13].

[a]Data not available.

[b]1950.

inequality in terms of a Lorenz curve or a Gini index. However, the coefficient of variation calculated for the per capita incomes among counties provides one indication of the degree of income inequality among areas and over time. The following equation, also used by Williamson [17], was used to estimate the weighted coefficient of variation in per capita income among counties in the two regions and in the state as a whole:

$$(3)\quad V_{w_j} = \sqrt{\frac{\sum_i (Y_{ij} - W_j)^2 \frac{F_{ij}}{P_j}}{W_j}}$$

where

$F_{ij}$ = population of the $i^{th}$ county in the $j^{th}$ region,

$P_j$ = the $j^{th}$ region's population,

Table 2. **COEFFICIENT OF VARIATION, AMONG COUNTIES, IN PER CAPITA INCOME[a] WITHIN THE STATE AND REGIONS, FLORIDA, SELECTED YEARS 1950-1970***

| Year | State | Region I | Region II |
|---|---|---|---|
| | ----------coefficient of variation-------- | | |
| 1950 | 0.2387 | 0.3044 | 0.1468 |
| 1959 | 0.1756 | 0.2431 | 0.1167 |
| 1962 | 0.1709 | 0.2169 | 0.1147 |
| 1965 | 0.1743 | 0.2081 | 0.1296 |
| 1966 | 0.1791 | 0.2078 | 0.1396 |
| 1967 | 0.1765 | 0.2040 | 0.1313 |
| 1968 | 0.1726 | 0.2027 | 0.1328 |
| 1969 | 0.1637 | 0.1980 | 0.1176 |
| 1970 | 0.1628 | 0.1879 | 0.1165 |

[a]In constant 1969 dollars.

*Source: Income data were provided by special computer runs made by the Bureau of Economic Analysis, U.S. Dept. of Commerce; population data were furnished by the Bureau of Economic and Business Research, University of Florida.

$Y_{ij}$ = income per capita of the $i^{th}$ county in the $j^{th}$ region,

$W_j$ = the $j^{th}$ region's income per capita,

i = 1, 2 . . . , 65 when j represents the state,
1, 2 . . . , 37 when j represents Region I, and
1, 2 . . . , 28 when j represents Region II.

Thus, for each year, each county's income deviation from the regional mean was weighted by its share in the regional population in that year. The higher values of the coefficient of variation indicate greater degrees of inequality in incomes. The number of counties is 65 rather than 67, because data were incomplete for Franklin and Monroe counties.

The coefficient of variation was consistently higher in Region I, where mean incomes were lower, than in Region II (Table 2). However, there was a reduction in variation within each region. While the reduction in variation in Region I continued through the 1960's, this trend did not continue in Region II. Thus, the major reductions in variation occured during the 1950's–the period of highest income growth rates. It appears that the changes that brought about the higher income growth rates also reduced the degree of inequality in incomes.

## FACTORS THAT CONTRIBUTED TO CHANGES IN LEVEL AND DISTRIBUTION OF INCOME

### Income Growth and Population Redistribution

The changes in variation in income among counties were separated into two components and the interaction between them: (a) changes due to divergent growth in per capita income, and (b) changes due to shifts in population weights. The following equation, also used by Williamson [17], was used to separate income variation into these two components:

$$(4)\quad \sum_i (Y_{ij}^1 - W_j^1)^2 F_{ij}^1 - \sum_i (Y_{ij}^0 - W_j^0)^2 F_{ij}^0 =$$

$$\sum_i (Y_{ij}^0 - W_j^0)^2 (F_{ij}^1 - F_{ij}^0) + \sum_i F_{ij}^0 [(Y_{ij}^1 - W_j^1)^2$$

$$- (Y_{ij}^0 - W_j^0)^2] + \sum_i (F_{ij}^1 - F_{ij}^0) [(Y_{ij}^1 - W_j^1)^2$$

$$- (Y_{ij}^0 - W_j^0)^2]$$

where

$Y_{ij}^0, Y_{ij}^1$ is the income per capita of the $i^{th}$ county of the $j^{th}$ region in the year 0 and year 1;

$W_{ij}^0, W_j^1$ is the income per capita of the $j^{th}$ region in year 0 and year 1;

$F_{ij}^0, F_{ij}^1$ is the share of the $i^{th}$ county's population in the $j^{th}$ region in year 0 and year 1, and

$i =$ 1, 2..., 65 when j represents the state,
1, 2..., 37 when j represents Region I,
1, 2..., 28 when j represents Region II,

$\sum_i (Y_{ij}^0 - W_j^1)^2 F_{ij}^1 - \sum_i (Y_{ij}^0 - W_j^0)^2 F_{ij}^0$ is the increase or decrease in total variance of the $j^{th}$ region between year 0 and year 1;

$\sum_i (Y_{ij}^0 - W_j^0)^2 (F_{ij}^1 - F_{ij}^0)$ is the change in the $j^{th}$ region's variance under the intial year income differences and the shifting population weights;

$\sum_i F_{ij}^0 [(Y_{ij}^1 - W_j^1)^2 - (Y_{ij}^0 - W_j^0)^2]$ is the change in the $j^{th}$ region's variance when the population weights are fixed at the initial year and variation in income growth is allowed, and

finally, $\sum_i (F_{ij}^1 - F_{ij}^0) [(Y_{ij}^1 - W_j^1)^2 - (Y_{ij}^0 - W_j^0)^2]$ is the change in the $j^{th}$ region's variance when both population and income are permitted to vary over the time period.

In the state as a whole, between 1950 and 1970, the effects were about equally divided between population redistribution and differences in income growth (Table 3). However, the relative effects differed considerably among periods and between regions. For the entire period, 1950 to 1970, the effect of population redistribution exceeded the effect of income growth in both regions but was higher in Region I, where average income was lower, than in Region II.

**Changes in Incomes Within Occupations**

In Region I, percentage increases in median incomes in the 1960's were higher for the lower income occupations compared to the higher ones, and the increases in the nonmetropolitan areas tended to exceed those in the metropolitan areas [12 and 13]. In the nonmetropolitan areas, incomes increased 81.4 percent for farmers and farm managers, 41.6 percent for labor except farm and mine, and only 25.9 percent for professional, managerial and kindred workers.

In Region II, the pattern of differences in the increases was not as consistent as it was in Region I, and the magnitudes of the differences were not as great as those in Region I. The largest increases occurred in the lower-income occupations in Region I where income levels were lowest. Thus, the differences in income growth within occupations contributed to the reduction in degree of inequality between regions and among counties within regions.

**Changes in Occupational Composition**

The occupational composition of the labor force shifted in ways that increased levels of income and reduced the levels of inequality [11, 12, 13]. The major shifts were from farm to nonfarm occupations, and the percentage changes in Region I exceeded those in Region II. Also, white workers as a percentage of the total labor force increased in each region.

**Population Migration**

The migration rates between 1950 and 1960 were much higher than those between 1960 and 1970 [7, 11, 12]. Out-migration was concentrated in Region I and in-migration in Region II. In Region II, in-migration occurred in each of the 29 counties between 1950 and 1960; from 1960 to 1970, in-migration continued in 26 counties, but usually at lower rates, while out-migration occurred in three counties.

In Region I, out-migration occurred in each of 13 counties in both decades; 13 counties incurred out-migration in one of the two decades, and the

Table 3. **PERCENTAGE OF VARIATION IN CHANGES IN PER CAPITA INCOME, AMONG COUNTIES, ASSOCIATED WITH CHANGES IN INCOME[a] AND IN GEOGRAPHIC DISTRIBUTION OF POPULATION, FLORIDA ***

| Area and source of variation | Period | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1950-1959 | 1959-1962 | 1962-1965 | 1965-1966 | 1966-1967 | 1967-1968 | 1968-1969 | 1969-1970 | 1950-1970 |
| | percent | | | | | | | | |
| State | | | | | | | | | |
| a. Population redistribution | 73.6 | 185.0 | 26.0 | 17.3 | 35.4 | 37.0 | 152.2 | 36.2 | 31.1 |
| b. Income change | 28.4 | -89.1 | 61.2 | 77.5 | 60.6 | 60.6 | -61.3 | 56.4 | 28.1 |
| a x b | - 2.0 | 4.1 | 12.8 | 5.2 | 4.0 | 3.0 | 9.1 | 7.4 | 40.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Region I | | | | | | | | | |
| a. Population redistribution | 50.2 | -28.9 | 17.1 | 37.1 | 9.0 | 26.9 | 103.6 | -83.1 | 51.3 |
| b. Income change | 59.0 | 124.0 | 70.6 | 50.4 | 87.4 | 68.8 | 1.6 | 181.2 | 20.8 |
| a x b | -9.2 | 4.9 | 12.3 | 12.5 | 3.6 | 4.4 | -5.2 | 2.1 | 27.9 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Region II | | | | | | | | | |
| a. Population redistribution | 92.7 | 191.9 | 24.5 | 10.1 | 87.0 | 23.2 | -26.6 | 52.2 | 38.0 |
| b. Income change | 8.4 | -92.4 | 62.7 | 86.4 | 15.9 | 73.4 | 124.3 | 31.1 | 22.2 |
| a x b | -1.1 | 1.5 | 12.8 | 3.5 | -2.9 | 3.4 | 2.3 | 16.7 | 39.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |

*Source: Basic data used in the calculcations were as follows: state income [16]; county income, special computer run was made by the Bureau of Economic Analysis, U.S. Dept. of Commerce; population data were supplied by the Bureau of Economic and Business Research, University of Florida.

[a]Absolute variations are given in [18].

other 12 counties had an in-migration in both decades.

Two major factors appear to be involved in the migration pattern. Persons motivated by employment opportunities were particularly responsible for out-migration in the lower-income counties of north central Florida and for in-migration into the higher-income counties and urban centers of both regions. A larger part of the in-migration into the lower-income counties probably was accounted for by retirees–for example, the Gulf coast counties of Lee, Charlotte, Hernando, and Citrus. The counties that experienced in-migration had higher average incomes than those with out-migration. However, a regression analysis showed very little correlation between income and migration rate within the two groups of counties, i.e., those with in-migration and those with out-migration.

The primary objectives of this study were to measure the personal income growth rates, to relate changes in income levels to changes in income inequality, and to determine what elements were associated with changes in the level and changes in degree of inequality of income. The area was limited to counties and counties grouped into two regions in Florida. The time period was generally from 1949 to 1969. There was a continous increase in the level and a reduction in the degree of inequality in incomes throughout the period. However, the rates of change in the 1950's declined substantially in the 1960's. Incomes increased within occupations. Increases in lower-income occupations were higher than those in higher-income occupations. Within occupations, incomes in lower-income areas increased faster than those in higher-income areas. There were relative shifts from lower-income to higher-income occupations–especially from farm to nonfarm occupations. Population shifted from lower-income to higher-income areas, although the extent of this shift was reduced by in-migration of retired persons into lower-income counties.

The fact that rates of increase in incomes were highest in lower-income occupations and lower-income areas, while relative employment in

these categories was decreasing, indicates that labor supply was decreasing faster than the demand for labor. In contrast, the supply of labor was more elastic or was increasing (shifting faster) in the higher-income occupations and areas.

Finally, the patterns of growth in incomes within occupations, the occupational shifts, and the geographic shifts in population contributed to a reduction in income inequality as well as to income growth. The pattern of change was very much like that described by Williamson [17] and Kuznets [6] as given in the introduction to this paper.

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