Title	INCOME DISTRIBUTION IN JAPAN: AN EXAMINATION OF THE FIES DATA, 1963-1971
Sub Title	
Author	MOUER, ROSS
Publisher	Keio Economic Society, Keio University
Publication year	1973
Jtitle	Keio economic studies Vol.10, No.1 (1973.) ,p.87- 109
Abstract	
Notes	
Genre	Journal Article
URL	http://koara.lib.keio.ac.jp/xoonips/modules/xoonips/detail.php?koara_id=AA00260492-19730001-0087

INCOME DISTRIBUTION IN JAPAN: AN EXAMINATION OF THE FIES DATA, 1963–1971

Ross Mouer*

TABLE OF CONTENTS

I. INTRODUCTION

In approaching the topic of income distribution in contemporary Japan, this paper has two major aims. One is the examination of changes in the amount of inequality during the nine-year period from 1963 through 1971, using Gini coefficients which have been calculated from the new series of the Family Income and Expenditure Survey which began in 1963. The second aim is to take a closer look at the survey's methodology. Following a brief historical sketch of the survey

and the presentation of some general trends in the data concerning income inequality, an appraisal is made of how the distribution of income, which is measured with the household as the earning unit, has been affected by variation in the size and composition of the household unit. Although little light is shown on the matter of family size and family income for any given year, it is suggested that changes in family patterns over time have contributed considerably to an overall trend toward a more egalitarian distribution. The discussion then turns to examine the income estimates themselves, discussing in some detail how the income estimates have been collected and then computed. Again the discussion leaves unanswered a number of questions, one of which has to do with the usefulness of the Gini coefficient (and perhaps even the Lorenz curve) as an analytical tool. Finally, attention is focused on the actual size of the FIES universe and the matter of sample representativeness. In dealing with the matter of representativeness, we are constantly frustrated by the problem of finding comparable data against which we can check the sample's representativeness. However, in the process of checking the sample's representativeness in terms of its various dimensions, such as geographic location, industrial affiliation, firm size concentration, occupational classification and age composition, we are able to learn much about the relevant importance of each dimension in determining the overall trends in income distribution in Japan. Indeed, it is this last section which seems to have the most relevance for setting the study of income distribution within the larger framework of social stratification theory.

Compared with the prewar period, there is now a wealth of data which can give us clues as to changes in the relative equality or inequality of income distribution in postwar Japan. Although there is no one survey which aggregates all persons or all incomes, the present data allow us considerable leeway for interpolation and interpretation. Table I lists the six most important surveys for the study of income distribution in Japan. Although all are governmental surveys, they include surveys from four different ministries. Therefore, each survey has its own history and purposes. As a result, these various surveys differ in terms of their universes, their units of measurement and the kinds of income included. The reason for choosing the FIES data is quite simple. The FIES data seem to be most frequently used in discussions of income distribution in Japan, not only by the government for its various publications (such as the annual white papers on the economy or national living standards), but also by private scholars. It is commonly believed that among the six surveys the FIES represents the best cross-section of the population as a whole and includes the vast majority of the population which is employed in non-agricultural activities. It is also believed that the FIES income estimates are most reliable since income in some of the other surveys is sometimes under-estimated in order to avoid taxation or obtain welfare benefits. Moreover, the survey unit is the household—the unit most nearly congruent with the spending unit. This means that the double entry approach can be employed for household accounts with income estimates always being made to balance

TABLE I. SURVEYS ON INCOME DISTRIBUTION IN POSTWAR JAPAN

English Title	Japanese Title	Unit of Measurement	Time Coverage	Agency Responsible for the Survey
Survey of National Tax Returns	Shinkoku Shotoku Zei Chōsa	Individual	Annual, beginning in 1874	National Tax Office Ministry of Finance
Survey of Wages and Salaries in the Private Sector	Minkan Kyūyo Jittai Chosa	Individual	Annual, beginning in 1949	National Tax Office Ministry of Finance
Family Income and Expenditure Survey	Kakei Chōsa	Household	Annual, beginning in 1950	Bureau of Statistics Office of the Prime Minister
Survey on the Economic Situation of Farming Households	Nōka Keizai	Household	Annual, beginning in 1921	Statistics Section Bureau of Economics Ministry of Agriculture and Forestry
Survey on Welfare Administration	Kōsei Gyōsei Kiso Chosa	Household	Annual, beginning in 1953	Bureau of Statistics Survey Research Ministry of Welfare
Basic Survey of the Employment Structure	Shūgyō Kōzō Kihon Chōsa	Household	Every three years, beginning in 1956	Bureau of Statistics Office of the Prime Minister

against expenditures. Finally, the survey is taken every month, with each household participating for a full six months as opposed to the once-a-year approach for most of the other surveys. Recognition of these various advantages has given the FIES data an air of unquestioned superiority. Thus, in addition to considering income inequality in Japan, I wish also to examine more closely some of these assumptions about FIES representativeness and reliability.

II. THE HISTORY OF THE FIES

The Family Income and Expenditure Survey or the FIES now has a history of over 25 years.[1] However, as Diagram I suggests, the procedure and content of the survey has changed several times during this period, thereby complicating comparisons over time. The origins of the FIES can be traced to the Consumer Price Survey (CPS) (Shōhisha Kakaku Chōsa) which was established in July 1946

[1] The following historical sketch of the FIES is based upon the explanation given by the Bureau of Statistics (Tōkei Kyoku) of the Prime Minister's Office (Sōrifu) in two publications: Kakei Chōsa Nenpō—Shōwa 45 Nen (Annual Report on the Family Income and Expenditure Survey: 1970) (Tokyo: Ōkura Shō, December, 1971), pp. 458–459, 483, 490–491 and 493; and the Kakei Chōsa Jisshi Yōryō (An Administrative Outline of the FIES) (Tokyo: Tōkei Kyoku, Sōrufu, March, 1970), pp. 61–79. A very shortened history is also given by Chotaro Takahashi, in collaboration with Ryotaro Iochi and Koichi Emi, Dynamic Changes of Income and Its Distribution in Japan (Tokyo: Kinokuniya Bookstore Company, Ltd., 1959), pp. 92–94.

DIAGRAM I

THE HISTORY OF THE FIES

Shōhisha Kakaku Chōsa
   July 1946-August 1950
   28 cities (each with a population
      over 50,000)
   500 consumer households
      (excluding agricultural households)
   Taken four times per month
   Used for calculating CPI as
      the dual price structure
      made other surveys unreliable.

Kinrōsha Settai Shūnyū Chōsa
   July 1948-August 1950
   Limited to the largest
      metropolitan areas.
   Limited to the households
      of employees.

Kouri Bukka Chōsa
   Retail Price Survey
   From June 1950

Shin Shōhisha Kakaku Chōsa
   September 1950-October 1951
   Recorded both incomes and expenditures for the
      households of employees.
   Continued with 28 cities (out of 232 cities) but
      changed 8 of the cities from the Shohisha Kakaku
      Chōsa.

Shōhi Jittai Chōsa
   November 1951-December 1952

Kakei Chōsa
   January 1953-June 1962
   Designated as an official Public Statistical Survey
      in November 1952.
   Added data on payments in kind.
   Began the use of household accounting books to
      record family finances.
   Sampling procedures were left the same.
   Length of household participation was increased
      from four months to six months beginning in
      April 1953.
   Ratio of employee households to other households
      was fixed according to the ratios recorded in
      the 1950 population census (One Percent Sample
      Results) beginning in October 1954.
   Tripled the number of sampling blocs, but reduced
      the number of surveyed households per sampling
      bloc by two-thirds, thereby maintaining the
      same overall total number of households. Changed
      from December 1955.
   Changed to a system of changing households
      within a given sampling bloc (which is used
      for one year) every six months.

Revised and Enlarged Kakei Chōsa
   From July 1962
   Revised sampling procedures so as to include the
      whole country in the following manner:
      a. seven largest cities (fixed)
      b. all prefectural seats of government (fixed)
      c. cities under 50,000 in population (rotated)
      d. towns and villages (rotated)
   Sample households increased from 4134 to 8064.
   Annual income data received from all households
      on a self-estimation basis.
   Sampling proportions based on the 1960 popula-
      tion census

in order to gather data on prices in the immediate postwar economy which was facing the usual problems associated with serious postwar inflation. Since the commonly accepted method of polling retail outlets was insufficient in view of widespread black market operations, the CPS was designed to ascertain the actual price situation. However, total expenditures for consumer spending were also recorded and this was the beginning of the family account books—ledgers which were distributed by the governmental survey agency, filled in by the participating household, and then returned for compilation. The survey was limited to families (about 5000 households) in the urban areas and relied heavily upon the willingness and self-discipline of participating households to keep track of their expenditures.

The CPS was supplemented from July 1948 by the Family Income Survey (FIS) (*Kinrōsha Setai Shūnyū Chōsa*). As a separate survey, the FIS sampled families separately from the CPS and limited its sample to the families of employees in the larger cities. Here it is important to note that the CPS was not limited to the households of employees but covered all families. Also, the CPS was taken in the smaller cities as well as the large ones. Thus, due primarily to differences in the areas (all urban areas as opposed to the large urban areas) and the kind of households (all households as opposed to those of employees) and the impossibility of balancing budgets in the immediate postwar period, the CPS expenditure totals were always greater than the FIS income totals.

In order to supply more reliable data once it was felt that domestic conditions has been markedly stabilized, the two surveys were combined in September 1950. The new survey, the New Consumer Price Survey (*Shin Shōhisha Kakaku Chōsa*), incorporated the broader sampling of the earlier CPS but abandoned the collection of information on prices since black market operations had subsided and it was felt that reliable data could be obtained from the Retail Price Survey which had been set up in June 1950. Eight of the 28 cities used for the CPS were changed, the survey design was entirely revised and the number of sample households set at about 4200. In November 1951 the survey was renamed as the Expenditure Survey (*Shōhi Jittai Chōsa*).

The combined survey was again revised in January 1953 with expenditure categories being changed from product groupings to use groupings. At this time the name was also changed, becoming the Family Income and Expenditure Survey (FIES) (Kakei Chōsa). The sample included three groups: households headed by employees whose main source of income was either wages or salary, households headed by self-employed persons including management and executives in the larger corporations, and a small group of households (including those of the unemployed) which fit into neither of the above groups. Monthly income estimates were obtained only from those in the first group. However, most pertinent data on expenditure behavior were published in the survey's annual report for each group, with the aggregate total for all groups also being given. This survey procedure was used for nearly ten years before being revised in July 1962 when the sampling method was entirely remodeled and the survey expanded to encompass

the whole nation. The previous number of 28 cities was increased to include 170 cities, towns and villages. The number of households was enlarged from 4200 to about 8000. These changes in the sampling procedure are shown in Table II. Another change at this time was the introduction of a section for annual income estimates on the survey schedule which was to be filled in by *all* households. However, since 1965 annual income data has been presented in such a way that we can know the distribution of income only for employee households or for

TABLE II. CHANGES IN THE SAMPLE POPULATION OF THE FIES

Date of Change	May 1951	January 1953	December 1955	July 1962	January 1968	January 1972	July 1972
Number of Municipal Units Surveyed	28	28	28	170	170	162	176
Number of Population Blocs Surveyed	318	318	954	1334	1338	1298	1366
Number of Households Surveyed	4134	4134	4134	8064	8028	7788	8196

Source: Sōrifu, Tōkei Kyoku (Bureau of Statistics, Prime Minister's Office), *Kakei Chōsa: Jisshi Yōryō* (The FIES: An Administrative Outline) (March, 1970), pp. 62–63. Figures for 1951, 1953 and 1972 were supplied by members of the Bureau of Statistics in an interview on January 27, 1973.

the total aggregate of all households. It is therefore impossible to derive the distribution of annual income for the households of non-employees alone. Although the Government claims that the results after 1963 for the families of employees in cities with populations over 50 thousand can be compared with data from the first ten years of the FIES, general opinion suggests that it is best to consider the results before and after 1963 as two separate series.[2]

III. SOME RESULTS FROM THE FIES DATA

The usual treatment of the FIES data has relied upon comparisons of Gini coefficients over time. As several kinds of Gini coefficients are often used in the economic literature, a brief explanation of how the coefficient used for the FIES data is calculated may be necessary. Based on the Lorenz curve, as shown in Diagram II, the Gini coefficient expresses the degree to which an actual income distribution (shown by the arc OB) diverges from an ideal distribution (straight line OB) by measuring the area between the arc and the straight line (shaded area I) and comparing it with the total area of the triangle OAB. The straight

[2] The post-1963 FIES data for cities with populations over 50,000 includes samples from 93 cities as compared with 28 cities in the older FIES sample. The expanded urban area survey, however, presently accounts for nearly ninety percent of all employee households and about 80 to 85 percent of all FIES households. Also, the method of aggregating incomes has changed. Thus, it is felt that the pre-1963 and the post-1963 data are not so comparable.

line represents the "egalitarian ideal" whereby any given percentage of the population always has a commensurate percentage of the population's total income. However, if portions of the population have less than "their" proportionate share of income while others have more, as is the case in the real world, the income-earning units (households in the FIES) can be arranged in the order of their relative share sizes, those with the smallest incomes coming first. The dis-

DIAGRAM II
LORENZE CURVE AND THE GINI COEFFICIENT
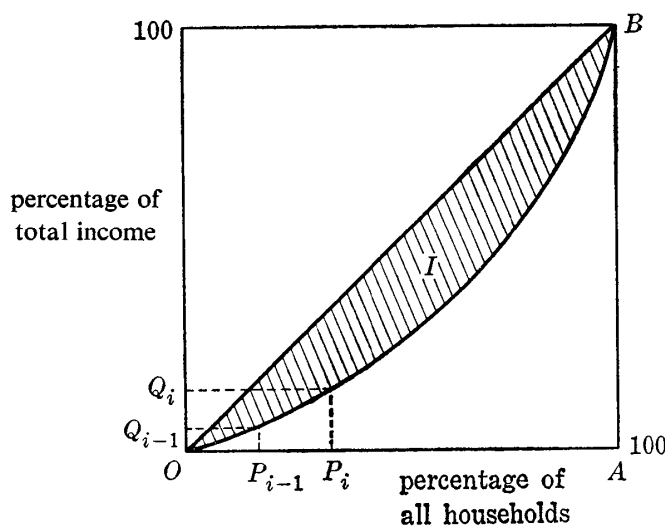
$$\text{Gini} = \frac{\text{area of shaded area I}}{\text{area of triangle OAB}}$$

$$= 1 - \frac{\sum_{i=0}^{c}(P_i - P_{i-1})\left(\frac{Q_i + Q_{i-1}}{2}\right)}{5000}$$

tribution for the accumulative figures for both households and income is expressed by the arc OB. Theoretically, increased equality is represented by pushing the arc OB upward and to the left toward the straight line OB. Similarly, increased inequality is represented by pushing the arc further downward and to the right, with "perfect inequality" being the "curve" OAB.

Gini coefficients for income distribution are given for the period from 1953 to 1971 in Table III. Columns A and B support the general contention that income inequality increased slightly from 1953 to about 1961, after which the trend was reversed. Although the year 1963 remains as a point of discontinuity, all columns nevertheless support the argument that a more egalitarian trend has appeared during the past ten years. A comparison of columns C, D and E as well as the data in Table IV suggests that the distribution of income among only the households of employees is more egalitarian than that for the aggregate of all households (including both employee households and non-employee households together). The Gini coefficients for all households are generally about four

percentage points above those for the employee households alone.   Unfortunately, however, without data for the households of non-employees, it is difficult to explain this differential with any degree of confidence.   On the one hand it is possible that the Gini for the combined aggregate of both types of households is higher

TABLE III.   GINI COEFFICENTS BASED UPON THE FIES:
1953–1971

Year	A Households of Employees in the Large Cities	B Households of Employees for all Japan. Actual Monthly Income. Based upon Quintiles.	C All Households for all Japan. Annual Income Estimates. Based upon Quintiles.	D Households of Employees for all Japan. Annual Income Estimates. Based upon Quintiles.	E Households of Employees for all Japan. Actual Monthly Income. Based upon Quintiles.
1953	.2869				
1954	.2938				
1955	.2989				
1956	.2934				
1957	.3049				
1958	.3036				
1959	.3001				
1960	.3067				
1961	.3149				
1962	.3011				
1963	.3031	.2153	.3117	.2604	.2153
1964	.2983	.2058	.2979	.2492	.2058
1965		.1980	.2829	.2415	.1982
1966		.2024	.2852	.2452	.2025
1967		.2061	.2803	.2383	.2064
1968		.1931	.2669	.2277	.1932
1969		.1792	.2571	.2196	.1794
1970		.1787	.2537	.2181	.1789
1971			.2586	.2203	.1788

Source: A. Murakami Masako, "Zaisei ni Yoru Shotoku Bumpai" (Income Distribution and the Affects of Fiscal Policy), in *Keizai Seichō to Zaisei Kinyū Seisaku* (Economic Growth and Fiscal-Monetary Policy), ed. by Fujino Shōsaburō and Udagawa Akihito (Tokyo: Keisō Shobō, June, 1967), p. 249.

B. Niida Hisao, Maibara Kin'ichi, and Etō Katsu, "Infureshon to Shotoku Saibumpai" (Inflation and the Redistribution of Income), *Keizai Bunseki* (No. 39: April, 1972), p. 25.

C. Calculated by the author from the 1970 FIES, p. 198.

D. Calculated by the author from the 1970 FIES, p. 202.

E. Calculated by the author from the 1970 FIES, p. 202.

than the coefficient for either of the two kinds of households when considered independently.   It is also possible that the distribution for non-employee households is more inegalitarian than that for employee households, with the Gini coefficient for the combined aggregate being somewhere in between those for the two distributions considered separately.   Indeed, it would seem reasonable to con-

clude that the distribution for non-employee households is more skewed, including a relatively large number of low income households plus a considerable number of very high income households. This latter interpretation would seem to be supported by three factors. One is related to the dual economy and the survival of many small-sized, family-run firms. In the manufacturing and retailing industries these firms are especially conspicuous. The return-to-capital factor accounts

TABLE IV. Various Gini Coefficents for the 1970 FIES

Case	Household Type	Geographic Area	Income Grouping	Income	Gini Coefficient
1	All	All Japan	Quintiles	Annual Estimates	.2537
2	Employee	All Japan	Quintiles	Annual Estimates	.2181
3	Employee	All Japan	Quintiles	Actual Monthly	.1789
4	All	All Cities	16 Income Groups	Annual Estimates	.2704
5	Employee	All Cities	16 Income Groups	Annual Estimates	.2305
6	Employee	All Cities	16 Income Groups	Actual Monthly	.1902
7	All	All Japan	16 Income Groups	Annual Estimates	.2694
8	Employee	All Japan	16 Income Groups	Annual Estimates	.2295
9	Employee	All Japan	16 Income Groups	Actual Monthly	.1879

Source: 1970 FIES, respectively pp. 198, 202, 202, 118–119, 118–119, 118–119, 106–107, 108–109, and 108–109.

for considerable variation from one industry to another and from one time period to another as profit margins in this sector are very sensitive to the market. Also not unrelated, as will be shown later (Section VII-C), the FIES sample has tended to underestimate the presence of employees in the smaller firms, thereby oversampling those in the large firms and the civil service, both of which offer higher and more standardized incomes. A second consideration with regard to the lower end of the income scale is the fact that the households of unemployed persons are included in the aggregate totals but do not enter the figures for the households of employees. A third consideration, having to do with the upper end of the income scale, is the inclusion of a small number of very high income households of executives and top management personnel within the classification for non-employee households. Here we may also include those with property income.

A second source of variation in Table IV is the slight difference between the Gini coefficients for all cities and those for all Japan. The difference is very small, but none the less is of considerable interest in view of the fact that the coefficients for the rural areas are generally higher than those for the urban areas, as will be

shown later (Section VII-A). The third point of variation in Table IV is the noticeable difference of four percentage points between coefficients based on annual income estimates and those based upon actual monthly income earnings. The reasons for this will be discussed below in Section V–B. Finally, the calculation of the Gini coefficient according to a finer breakdown of the income groups with 16 categories, as opposed to the use of quintile averages, results in coefficients which are about one and a half percentage points higher. This simply reflects the smoothing of the Lorenz curve which is caused by the use of increasingly smaller income intervals.

IV. FAMILY SIZE AND INCOME DISTRIBUTION

One major problem in studying income distribution is our inability to adequately define the earning unit. When the household unit is chosen as the earning unit, as it is in the FIES, there are two major difficulties. One is the change in household size over time and the second is the variation in household size between households at different income levels. A classic study of this problem as it occurs in the British tax returns is that of Richard Titmus.[3] In terms of the FIES data, and the Japanese context one possible hypothesis is summarily expressed by the Japanese saying, "binbonin no kodakusan," which suggests that the rich show either restraint or moral prudishness while the poor produce like rabbits and consequently have larger families. If such a hypothesis were indeed consistent with reality, income differentials calculated with the household as the earning unit would become even wider if calculated on an individual basis. On the other hand, if household income were to vary somewhat directly with household size, one might suspect that the actual distribution of income on an individual basis would be more egalitarian than that for the household units.

With regard to this point, however, the data is extremely difficult to interpret as a number of other variables also seem to be at work. In addition to the changes in family size which accompany transitions through the life cycle, there is also variation in the number of earners which provide secondary sources of household income. Even among the higher income groups it is possible that in some cases high income has resulted in the establishment of independent living arrangements for young single persons in the work force and the elderly while in other cases affluence has allowed families to consider additional children as a durable good for either consumptive satisfaction or productive investment. Finally, the importance of these several factors varies with the occupation, firm, industry and geographic location of the household head.

Looking first at the relationship of family income and family size, we find an interesting paradox. A casual glance at the data in Table V suggests that household size increases with successive increments in household income. Indeed,

---

[3] Richard M. Titmuss, *Income Distribution and Social Change: A Study in Criticism* (London: George Allen and Unwin, Ltd., 1962).

based upon the data for 1970, the Gini coefficient for households of employees for all Japan drops by four percentage points from the .2295 (given in Table IV, line eight) based upon the income distribution among households to a more egalitarian .1892 for that between individuals.[4] This is shown by the movement of the Lorenz curve in Diagram III from curve A to curve B. However, the data in Table VI shows that, when classified by family size (employee households, all Japan), income per household and income per individual vary inversely. In

TABLE V. INCOME GROUPS AND FAMILY SIZE: 1970
(employee households, all Japan)

Income Class	Average Age of the Household Head	Annual Estimated Income	Index	Average Number of Household Members	Average Number of Employed Persons	Labor Force Participation Rate	Average Per Capita Income	Index
1	48.3	263	1.00	2.87	1.13	39.37	91.64	1.00
2	48.7	360	1.37	2.68	1.30	48.51	134.33	1.47
3	42.4	453	1.72	3.19	1.31	41.07	142.01	1.55
4	39.4	550	2.09	3.23	1.35	41.80	170.28	1.86
5	37.6	645	2.45	3.46	1.35	39.02	186.42	2.03
6	37.0	746	2.84	3.61	1.36	37.67	206.65	2.26
7	37.7	848	3.22	3.67	1.38	37.60	231.06	2.52
8	37.4	946	3.60	3.71	1.42	38.27	254.99	2.78
9	39.6	1091	4.15	3.89	1.48	38.05	271.39	2.96
10	41.4	1287	4.90	4.02	1.53	38.06	320.15	3.49
11	42.5	1492	5.67	4.12	1.63	39.56	365.14	3.99
12	44.1	1693	6.44	4.15	1.71	41.20	407.95	4.45
13	45.8	1893	7.20	4.26	1.89	44.37	444.37	4.85
14	47.0	2208	8.40	4.42	2.02	45.70	499.55	5.45
15	48.6	2711	10.31	4.37	2.06	47.14	620.37	6.77
16	50.1	3359	12.77	4.56	2.07	45.39	736.62	8.04

Source: 1970 FIES, pp. 108–109.

other words, growing household size more than offsets the change in total household income. As a result, the Gini coefficient for households is .0531 as compared with a .1054 coefficient for individuals, a near doubling of the coefficient with a difference of over five percentage points.[5] This is shown in Diagram III by the shift from curve C to curve D. Although neither annual nor monthly income data by household size is available for all households (employee households and

[4] Calculated by the author from the 1970 FIES, pp. 106–107. The Gini coefficient for individuals was calculated by using the income figures in column eight of Table V and population figures derived by multiplying the number of households in each income group by their average size.

[5] Calculated from the 1970 FIES, pp. 88–89.

TABLE VI. FAMILY SIZE AND AVERAGE INCOME: 1970
(employee households, all Japan)

Average Household Size	Number of Household	Average Age of the Household Head	Average Number of Employed Persons	Real Monthly Income	Index	Per Capita Income	Index
2.00	598	43.6	1.32	95.4	1.00	47.7	1.00
3.00	1246	40.1	1.40	102.3	1.07	34.1	.72
4.00	2099	40.1	1.49	115.3	1.21	28.8	.60
5.00	846	42.0	1.76	125.7	1.32	25.1	.53
6.00	291	42.7	2.04	129.1	1.35	21.5	.45
7.00	92	44.8	2.32	137.5	1.44	19.6	.41
8.18	25	46.0	3.19	135.1	1.42	16.5	.35

Source: 1970 FIES, pp. 88–89.

DIAGRAM III
SHIFTS IN THE LORENZ CURVE FROM HOUSEHOLD INCOME DIFFERENTIALS
TO INDIVIDUAL INCOME DIFFERENTIALS
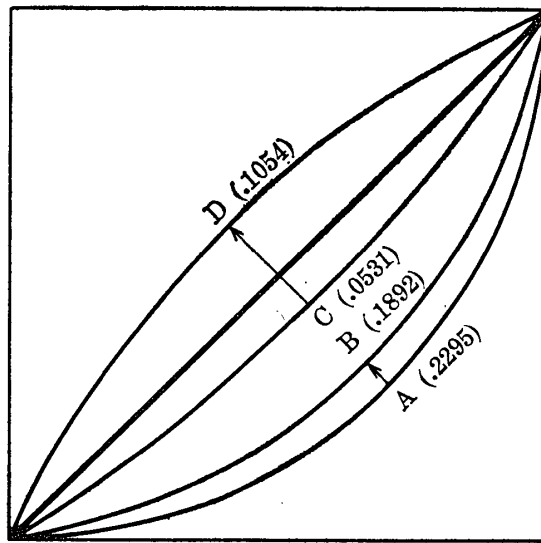
non-employee households), a comparison of expenditures for employee households and all households and the relative weight of expenditures by household size, it would seem that this "reversal effect" is even greater among the households of non-employees. Even recognizing the fact that certain economies of scale exist for households as well as for factories, one can still only conclude that the equalizing effect for the data in Table V and the "reversal effect" for the data in Table VI are a little less significant than they might otherwise appear if considered alone. We are still left without knowing which arrangement of data should be considered more conclusive.

Therefore, it would seem reasonable to question the possibility that one or more other variables might also be involved. Given the large amount of literature which has characterized the Japanese wage system in terms of the considerable weight attached to the *nenko* or seniority based component, one might be tempted to explain the interrelationship between family size and income in terms of the life cycle of the household head. In other words, as the "man in the family" gets older, he and his wife tend to enlarge their family and the man's income increases in proportion to his growing needs as his household budget increases. And, as the household head enters the latter part of his fifties and retires, his income begins to drop as his children become married or otherwise independent. The approach to test the plausibility of this hypothesis is rather indirect and requires two preliminary steps. First is the question of whether family size is so nicely correlated with the life cycle of the household head. Second is the question of whether household income also follows a similar patter as the household head ages. If a positive relationship exists in each of the above situations, then perhaps we can conclude that household income and household size are both positively correlated with and functions of the life cycle of the nouse hold nead.

The data in Table VII, which is arranged according to the age of the household head, would seem to support this interpretation. However, the data are again confusing as we return to look at the same data arranged according to income groups in Table V (1970). Similar data for 1971 are shown in Table VIII and the accompanying Diagram IV. Although household size and household income do vary directly, it is clear that age declines with increases in income throughout the lower half of the income scale while increasing with income on the upper half (Diagram IV). However, another factor, namely labor force participation, also seems to be at play. As household size (along with income) increases, the number of household members in the work force increases. The relative importance of the *nenko* phenomenon and the increasing propensity to participate in the labor force as family size increases is put into better perspective in Diagram V. Here we can see that the change in household income in Table VII between the first age group (less than 24 years of age with 1.53 persons in the labor force) and those in the second age group (25–29 years of age with 1.36 members in the labor force) clearly shows both effects. Despite the drop in participation, total household income increases, though by less than half the amount of the increase in the income of the household head. Increases in household income as we progress from the second group to the fifth group (40–44 years of age) are directly proportionate to the increases in the income of the household head. The *nenko* effect clearly seems to be at work, although beginning to weaken after the household head reaches the age of 30–34 and his income comes to occupy the highest percent of total family income during his life cycle. In contrast to the *nenko* effect, the importance of work force participation becomes increasingly important after 45 years of age and the household head's portion of total household income markedly declines.

TABLE VII.   AGE OF THE HOUSEHOLD HEAD, FAMILY SIZE, INCOME AND
WORK FORCE PARTICIPATION: 1970
(employee households, all Japan)

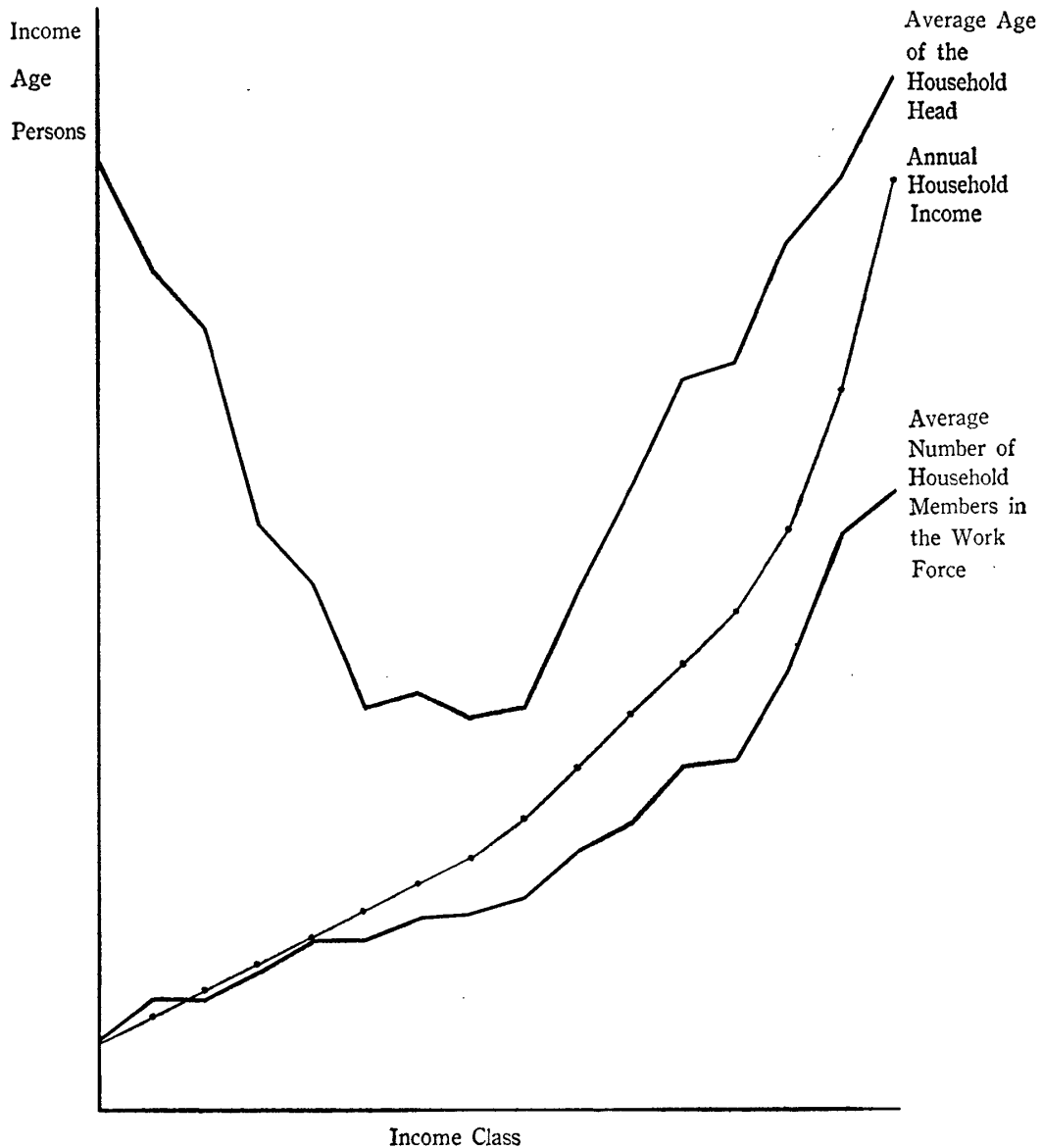| Group Age of the Head	Average Age of the Household Head	Sample Size	Average Annual Income Per Household	Average Real Monthly Income Per Household	Average Household Size	Average Number of Family Members in the Work Force
-24	22.8	128	135	79,317	2.88	1.53
25-29	27.6	967	134	87,250	3.22	1.36
30-34	32.2	1815	149	96,482	3.84	1.32
35-39	36.9	1997	166	108,222	4.18	1.37
40-44	41.9	1770	184	123,100	4.20	1.46
45-49	46.7	1323	202	132,740	4.05	1.67
50-54	52.0	877	203	136,343	3.88	2.03
55-59	56.7	627	198	127,168	3.64	2.08
60-64	61.8	317	182	112,696	3.59	2.02
65-	68.1	180	144	85,877	3.13	1.79

Source: 1970 FIES, pp. 88-89.

TABLE VIII.   INCOME, AGE AND WORK FORCE PARICIPATION: 1971
(employee households, all Japan)

Income Class	Average Household Income	Average Age of the Household Head	Average Number of Household Members in the Work Force
1	243	47.9	1.13
2	351	45.9	1.21
3	452	44.8	1.21
4	550	41.1	1.26
5	648	40.0	1.32
6	746	37.6	1.32
7	847	37.9	1.36
8	948	37.4	1.37
9	1094	37.6	1.40
10	1294	39.8	1.49
11	1492	41.7	1.54
12	1687	43.8	1.65
13	1882	44.1	1.66
14	2205	46.4	1.84
15	2714	47.6	2.09
16	3518	49.5	2.17

Source: 1971 FIES, pp. 112-113.

DIAGRAM IV
INCOME, AGE AND WORK FORCE PARTICIPATION: 1971

Income

Age

Persons

Average Age
of the
Household
Head

Annual
Household
Income

Average
Number of
Household
Members in
the Work
Force

Income Class

Nevertheless, the age-income-family size curves still leave us with many doubts. One can still argue, as shown in Part A of Diagram VI, that family size increases and then decreases as all household heads age, but that the average family size for poorer households is still larger than that for households which are better off. Moreover, one can also argue that the same it true of the seniority-wage curve as suggested in Part B of the same diagram.

Although Diagram VI is a great simplification, the fact of its essential accuracy is clearly supported by the study of the Ministry of Welfare which is presented in Diagram VII. Here we can clearly see that occupation is an important variable

not only for income patterns but also for labor participation and family size. Moreover, the relationship between participation and family size is not so clear. Finally, I think it is safe to conclude that there are many workers who still remain outside the so-called "company system." These workers are sometimes migrant workers (*dekasegi*) sometimes "special status" employees (*shoku-taku*), sometimes temporary laborers (*rinjikō*); they stand outside of the "company system" and are seldom able to enjoy the annual benefits of life-time employment which include promotion, large bonuses and job security. Indeed, if we look

DIAGRAM V
INCOME OF THE HOUSEHOLD HEAD, HOUSEHOLD INCOME, AND THE
AGE OF THE HOUSEHOLD HEAD: 1970
(employee households, all Japan)
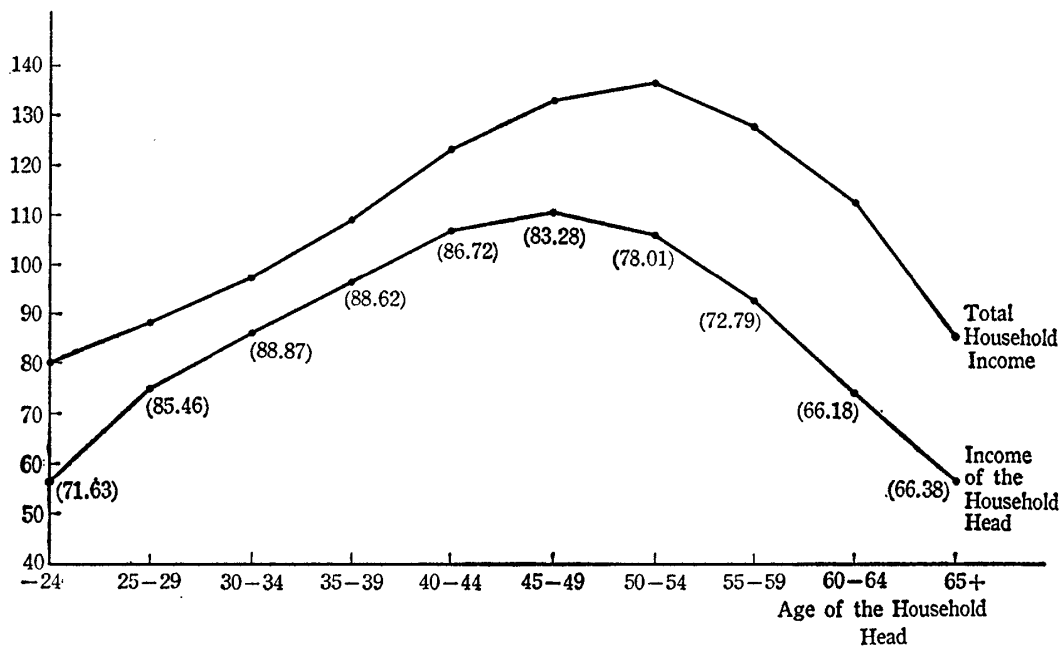
Note: Percentages within the paratheses indicate the percentage of total household income earned by the household head.
Source: 1970 FIES, pp. 88–89.

at the data for the households of non-employees, we see that the relationship between age and income is even weaker. Although the relationship does seem to hold for the higher income groups, if we examine those who are in these higher income groups, we will find many of them in executive positions or the professions—positions which require age and experience not just in Japan but in any country. Moreover, even among those within the "company system," it is important to differentiate between those at different occupational levels. Although all such employees enjoy the security of the seniority wage, the rate of increment as well as the amount is considerably different for different occupational groupings which are roughly parallel with educational groupings (See Diagram VI–B). As

DIAGRAM VI

A. Age and Family Size   B. Age and Income
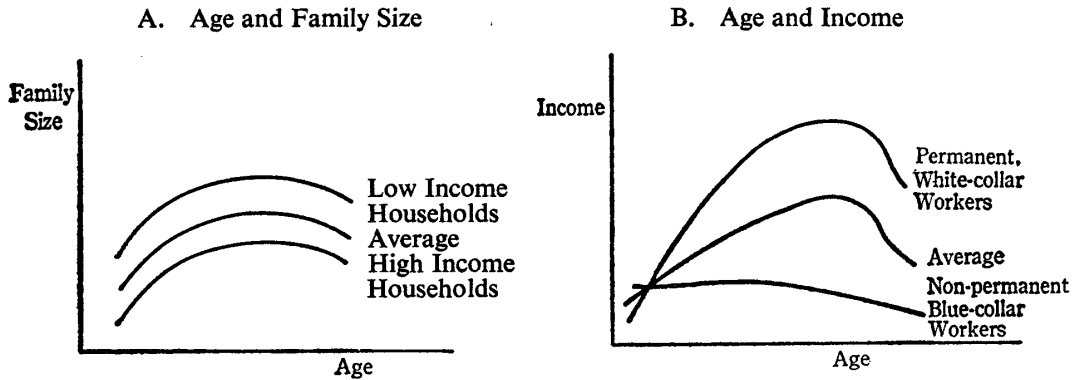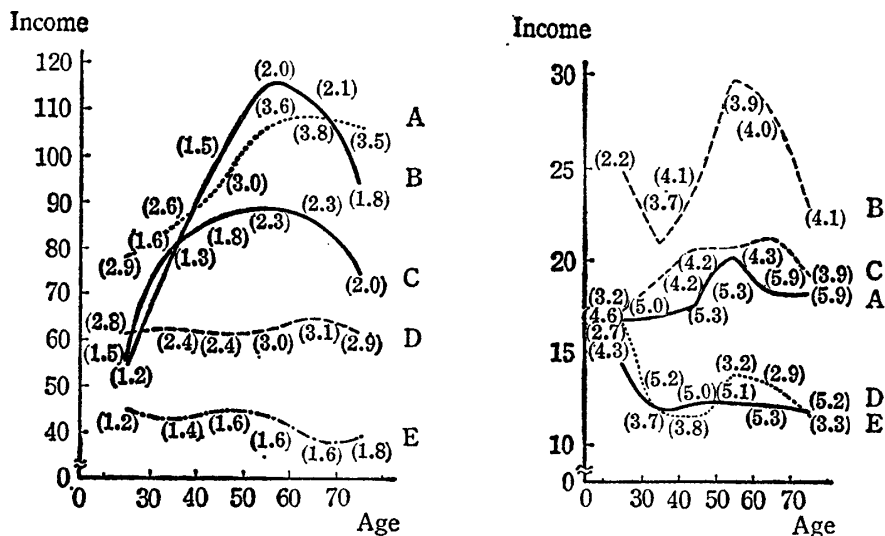

DIAGRAM VII

A. Variation in Household Income According to the Age and Occuaption of the Household Head

B. Variation in Household Income Per Household Member According to the Age and Occupation of the Household Head

Notes: The figures in parentheses indicate the average number of workers per household in the first diagram and the average household size in the second diagram.

The various types of households are indicated as follows:

A Agricultural households with at least one member who is an employee

B Ordinary employee households

C Households of the self-employed (entrepreneurs)

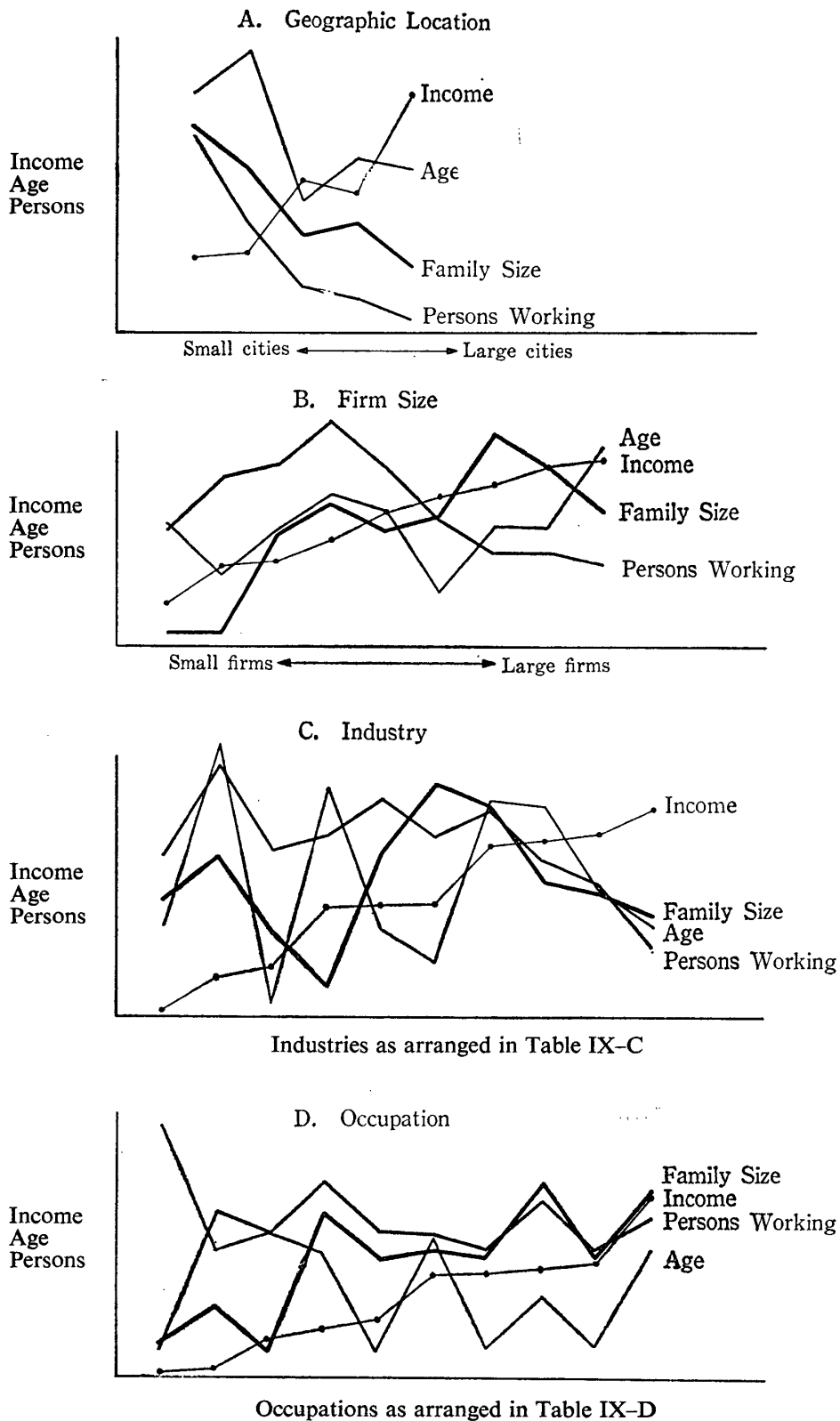D Households engaged only in argiculture

E Households of common laborers

Source: Kōsei Shō Daijin Kanbō (Office of the Minister of Welfare), Chōsa Bu (Department of Statistics), *Kokumin Seikatsu Jittai Chōsa Hōkoku* (Report on the National Standard of Living) (Tokyo: May, 1970), pp. 22–23.

TABLE IX. THE EFFECT OF VARIOUS AGENTS OF STRATIFICATION ON THE
CORRELATION OF INCOME, AGE, FAMILY SIZE AND
WORK FORCE PARTICIPATION: 1970
(employee households, all Japan)

Stratification Variable	A Number of House- holds	B Real Monthly Income	C Family Size	D Number of House- hold Members in the Work Force	E Age of the House- hold Head	F Labor Force Partici- pation Rate
A. Geographic Location						
Major Cities	835	120.9	3.85	1.50	40.8	.389
Middle Cities	2493	111.8	3.89	1.52	41.0	.391
Small Cities, Size A	1174	113.0	3.88	1.53	40.6	.394
Small Cities, Size B	311	106.2	3.94	1.59	42.0	.404
Towns and Villages	385	105.9	3.98	1.67	41.6	.420
B. Firm Size (number of employees)						
1–4	176	74.4	3.67	1.53	40.7	.444
5–9	252	88.5	3.67	1.58	39.8	.431
10–29	609	91.3	3.85	1.59	40.6	.413
30–99	663	99.1	3.91	1.63	41.3	.417
100–299	471	109.3	3.86	1.59	41.0	.412
300–499	166	115.5	3.89	1.54	39.5	.396
500–999	197	120.1	4.04	1.51	40.7	.374
1000–	1432	127.0	3.98	1.51	40.7	.379
Public Employees	1203	128.8	3.90	1.50	42.2	.385
C. Industry						
Construction	426	92.3	3.83	1.51	40.8	.394
Others	64	98.8	3.91	1.68	44.2	.430
Wholesale and Retailing	684	100.7	3.77	1.52	39.4	.403
Mining	46	112.0	3.67	1.55	43.4	.422
Manufacturing	1487	112.1	3.95	1.62	40.8	.410
Transportation and Communication	775	112.4	4.05	1.55	40.2	.383
Electricity, Gas, Water	100	123.9	4.01	1.60	43.2	.399
Private Services	787	124.4	3.87	1.51	43.1	.390
Public Services	598	126.0	3.85	1.47	41.6	.382
Finance, Insurance	231	130.6	3.81	1.35	40.9	.354
D. Occupation						
No Occupation	370	52.5	3.09	.54	64.4	.175
Day Laborers	41	53.6	3.42	1.79	48.8	.523
Other Occupations	14	65.6	3.04	1.61	52.0	.530
Merchants and Artisans	1702	68.7	4.29	2.07	48.4	.483
Regular Workers—Blue Collar	2089	72.7	3.89	1.63	40.5	.419
Professional Services	197	89.7	3.94	1.61	51.7	.409
Office Workers (Private Sector)	1991	90.2	3.91	1.48	41.2	.379
Private Administrators	198	92.1	4.60	1.93	41.9	.420
Public Sector Office Workers	1076	92.4	3.92	1.48	41.9	.378
Corporate Administrators	194	118.8	4.52	1.77	49.7	.394

Source: 1970 FIES, pp. 66–67, 93, 92–93, 82–83.

DIAGRAM VII
The Effects of Various Agents of Stratification on the Correlation of Income, Age, Household Size and Work Force Participation: 1970
(employee households, all Japan)

A. Geographic Location

Income
Age
Persons

Income

Age

Family Size

Persons Working

Small cities ←————————→ Large cities

B. Firm Size

Income
Age
Persons

Age
Income

Family Size

Persons Working

Small firms ←————————→ Large firms

C. Industry

Income
Age
Persons

Income

Family Size
Age
Persons Working

Industries as arranged in Table IX-C

D. Occupation

Income
Age
Persons

Family Size
Income
Persons Working

Age

Occupations as arranged in Table IX-D

we will show below (Section VII-C), a disproportionately high percentage of the sample household heads have been working for large firms and the government where the seniority type of wage system seems to be most firmly implanted.

Finally, it is of interest to know how family size and age vary with income when examined in terms of some of the other agents of stratification. Table IX gives data for family size, income, work force participation and the age of the household head as they vary by geographic location, industry, firm size and occupation. As the data is difficult to interprete, it has been presented graphically in Diagram IV. In moving from rural to increasingly urban areas, income increases and family size decreases. Moreover, the number of employed persons per household decreases even more rapidly than family size. There also seems to be a negative relationship between age and income. Arranged by firm size or industry, it is even more difficult to find any clear relationship between income and the other variables. The same is also true for the occupational groupings. However, if we regroup the ten occupational groups into just four groups, divided at those places where considerable discontinutiy appears in terms of household income, we can again see some interesting relationships. Of particular interest is the relationship between the two middle groups which account for nearly ninety percent of all households. The lower income group is characterized by slightly larger families (4.07 members to 3.96), more persons gainfully employed per household (1.80 members to 1.51), and a higher average age for the household head (an average age of 44.1 to 42.3). The only relationship which seems to hold fairly constant throughout in all four cases is the relationship of work force participation and family size. On this point, however, it is important to keep in mind that we are talking about labor force participation in absolute terms; correlates of the relative participation rate (household members in the work force as opposed to the total number of household members) still remain unclear.

Finally, there is the matter of participation in the work force over time. As Table X suggests, the number of persons in the labor force per household has increased considerably while the size of the average household has decreased. One would speculate that these two changes have contributed not only to a thirty percent increase in the labor force between 1955 and 1970, but also no doubt have contributed to a more equal distribution of income among households. After all, one would expect something less than a perfect correlation between the earning power of household heads and others within the household. Another oddity, however, is the fact that the household head has consistently brought home between 82 and 84 percent of the household's income. This is in spite of the fact that other household members have increased their participation in the labor force by 22 percent (from .45 persons to .55 persons) between 1955 and 1970 (Table X, column C). Thus, it would seem that the wage differential between the household head and the other household members in the work force has increased. Since the household head tends to be predominately male as opposed to female, and middle aged rather than aged (over 60) or young (under 30), perhaps it would do

well to ponder more carefully some of these dimensions of stratification as well.

Considering the data given above, it would seem premature to conclude anything about the relationship between household income, age of the household head, labor force participation, and family size. On the one hand, at certain points on the income scale and for certain households income seems to increase directly with the age of the household head and consequently with the size of his family. At the same time, on the other hand, participation in the work force also seems

TABLE X.   FAMILY SIZE AND WORK FORCE PARTICIPATION: 1951-1971
(employee households, all Japan)

A Year	B Average Household Size	C Average Number of Household Members in the Work Force	D Work Force Participation Rate $\dfrac{C}{B}$
1951	4.68	1.38	29.5
1952	4.77	1.41	29.6
1953	4.79	1.44	30.1
1954	4.80	1.46	30.4
1955	4.71	1.45	30.8
1956	4.45	1.46	32.8
1957	4.45	1.47	33.0
1958	4.46	1.48	33.2
1959	4.41	1.51	34.2
1960	4.36	1.52	34.9
1961	4.22	1.50	35.5
1962	4.17	1.49	35.7
1963	4.19	1.53	36.5
1964	4.16	1.52	36.5
1965	4.12	1.52	36.9
1966	4.07	1.54	37.8
1967	4.04	1.54	38.1
1968	3.97	1.54	38.8
1969	3.89	1.53	39.3
1970	3.90	1.55	39.7
1971	3.87	1.54	39.8

Source: FIES annual reports, 1951-1971.

to be an important factor determining household income, and work force participation depends on and therefore also varies somewhat directly with household size. It would thus seem safe to conclude that, at least in the FIES sample, income variation tends to be slightly equalized by variation in family size and that this tendency to some extent reflects factors related to one's life cycle, the seniority wage system, the age of the household head, household size, and the household's participation in the work force. At the same time, however, the above data in Table IX and Diagram VII, as well as the data of the Welfare Ministry in Diagram VI, strongly suggest that a number of other variables are also at work. In

particular, geographite location seems to be a significant variable. Therefore, the above data should also make us suspicious of explanations which stress too heavily the importance of the seniority wage system as the major factor accounting for income differentiation and the life cycle for all changes in family size; very clearly there are other variables at work: geographic location, firm size, industrial affiliation and occupation.

One interesting aside with regard to participation in the labor force has to do with the applicability of Paul Douglas' formulation for participation.[6] By comparing some thirty cities in the United States, Douglas demonstrated a rather strong negative correlation between income and the labor-force-participation rate. Looking at Tables V and VIII, absolute participation increases with income, although the rate of participation tends to move in a U-shaped fashion, first dropping with income and then increasing across the upper half of the income spectrum. In this case it would seem rather that participation can better be explained in terms of family size and the life cycle—the wife's dropping out of the work force upon or shortly after marriage and her subsequent re-entry after the children are in school. In particular, the entry of children into the work force upon graduation is an important factor accounting for additional household income after the household head has reached his mid-forties. None the less, this still does not seem to deny the possibility that larger families are more pressed for income on a per capita basis, as suggested in Table VI, and are thereby motivated to enter the labor force for economic reasons as hypothesized by Douglas. Douglas' formulation also seems to fit if we compare participation rates and household income by geographic location, firm size industry and occupation (Table IX, Column F). In each case a rather definate negative correlation seems to exist between income and the participation rate. This is particularly true on a geographical basis—the dimension on which Douglas initially investigated this phenomenon.

This problem of motivation and cognitive or psychological perception may also have relation to the increase in participation rates over time (Table X) despite remarkable improvements in income. I think any number of surveys will show that the average Japanese worker has not considered himself particularly enriched by the tremendous growth in Japanese GNP. Indeed, to a considerable extent, it has been out of a very real sense of poverty, not affluence, that the average Japanese has worked so hard. In other words, his sense of relative income inadequacy may well have been the prime motivating force for additional household members to enter the work force. Therefore, in behaving in a fashion consistent with Douglas' hypothesis, the Japanese family can certainly be called rational to the extent that such increased participation has resulted in the increased income increments it desired: the simple expansion of the Japanese work force has played

---

[6] Paul H. Douglas, *The Theory of Wages* (New York: Augustus M. Kelly, Bookseller, Reprints of Economic Classics Series, 1964), pp. 269–294.

not an insignificant role in accounting for Japan's rapid GNP growth. However, the very recent awareness of Japan's overall economic power and more favorable international comparisons of per capita income have over time led to demands for shorter working hours and a slight decline in the overall work force participation rate since about 1970. Nevertheless, the fact remains that Japanese per capita income is about half that of the United States while fifty percent of Japan's population is in the labor force as compared with only about forty percent in the United States.*

Keio University

* Due to the limitations of space and the length of the manuscript, Sections V, VI, VII and VIII will be published next year in Vol. XI, No. 1.