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Estimates of Annual Births and of the General Fertility Rate in Japan, 1890–1920

—Derived by Projecting the Census Population of 1920 Backwards—

by Masaaki Yasukawa

One of the major defects in Japanese demographic data is the lack of an annual series of births before 1920 when the first census was taken (the census date, October 1, 1920).

The ideal situation for estimating the births in any of the previous years, aside from working with registration figures, would be the one in which an accurate census age distribution and a cohort life table which covers the years between the time of birth and the time of enumeration are available.

In order to estimate the number of births by the inverse survivorship method, the cohort life table has been made up on the basis of "Reformation of Japanese Pre-census Life Tables" by Mr. Matsuura.

For the validity of the equations, it is necessary to make allowances for the effect of the 1918 and 1920 influenza epidemic, and the effect of migration. Since one of the assumed cohort life tables was made up according to the two life tables—the 1909–13 and 1921–25 life tables—it does not reflect the unusual increase in mortality in 1918 and 1920 as a result of the epidemic. The number of survivors reckoned backward on the basis of this cohort life table would therefore be too small. In this study, however, these two effects were not taken into account.

Calculations involved in estimating the number of births have been made for the two sexes separately. Therefore, to test for the consistency of the estimates, the sex ratios at birth for the period 1890–1920 were also calculated. The series is mostly consistent but for the rather low values of the sex ratios in 1898 and 1899. This anomaly disappeared when these cohorts were obtained from the 1925 census age distribution. This suggests that the deficit in male births in 1898 and 1899 as calculated from the 1920 census age distribution may be due to the fact that the population aged 21 and 22 in 1920 were of military ages.

Having estimated the number of births during the period 1890–1920,

it is possible to estimate the general fertility rate if only we have estimates of the number of females aged 15–44 during the same period. The latter was obtained by projecting backwards by 5-years the 1920 census population by age by means of the ${}_5L_x$ values derived mostly from the reformed life tables. The estimates for the intervening years were then obtained by simple interpolation.

This study has been undertaken with the aid of prof. Ansley J. Coale, director of the Office of Population Research at Princeton University. I wish to thank him for suggesting this problem to me and for his guidance.

Geographical Mobility of Labor and Economic Incentives*

by Shunsaku Nishikawa

Various available data on interregional labor mobility are analysed in relation to those economic incentives as regional income and wage levels. Major findings are summarized as follows.

(1) Outflows of labor force from some regions are negatively correlated with (average) family income in respective regions.

(2) Inflows of labor force into some regions are positively correlated with (average) wage earning in respective regions.

These findings are obtained from interregional cross-section analyses of variety of data during 40 years or so period including pre- and post-war years.

* These empirical results are written in English more fully in my paper, "Domestic Migration in Japan," *Keio Business Review*, No. I, 1962 (forth-coming), together with the further consideration and more detailed findings.

Measurement of Wage Contours

by Yohko Sano

I. The Concept

The concept of wage contours as well as job clusters was introduced by John T. Dunlop. Wage contours are a new concept in order to explain the wage determination and the wage changes. This sort of thinking was not presented only by Dunlop but also by others, for example, Clark Kerr. Wage contours represent a route of wage spreading, for instance, the spreading process of key bargaining. Dunlop suggested that the cause of wage contours formation is mainly due to (1) the source of labor supply, (2) the product market, and (3) trade unions.

II. The Data

To examine the wage relationships among different places, industries, sex, jobs and so on we need long series of wage changes. We have several kinds of wages statistics, but among all the official reports only the Monthly Labor Survey gives us the necessary information. The Monthly Labor Survey shows us average monthly cash earnings par regular worker by industry, size, status, sex, item of cash earnings and prefecture though all of them are not cross-tabulated. We have no information about age, final school career, occupational career and duration of service in MLS. Apart from it we are able to get well tabulated figures in the Basic Survey of the wage Structure from 1954, but it is annual. When the wage structure process is considered, it will be inconvenient to use annual data, because the frequency of the survey must be less than 6 months to understand lags.

The Monthly Labor Survey is the only one we can use, but its tabulation is not good for our purpose. So we also used the original data of MLS. The fault is that they have often altered the samples. As is known, new samples increase relatively the number of small size establishments and consequently show lower wages than before. The original of the present MLS started in July 1923 by the former Ministry of Home Affaires, and it was reformed several times after that and in 1951 it was newly presented by the Ministry of Labor. It excluded small size establishments (which employ less than 30 workers) till 1957 and now excludes less than 5 workers establishments. Another weakness is that the result which

purports to show district differences is often not so reliable because of small samples.

III. The processing

The greatest difficulty lies in smoothing the time series data of wages, We tried several ways of smoothing leaving a trend and cycles but cancelling seasonal and monthly variations. We deal with monthly contract cash earnings instead of total cash earnings, because in Japan most workers receive special cash payments in the summer and the end of the year. We examined the following smoothing results.

(1) monthly contract earnings
(2) 3 month moving averages of (1)
(3) 5 month moving averages of (1)
(4) (1)/ monthly worked hours
(5) 3 month moving averages of (4)
(6) the sum of 3 monthly contract earnings
(7) the sum of 3 monthly (4)

Further we examined the changes in employment concerned. The average wages are influenced by the changes in employment composition. We found there is no definite relation between average wages and employment.

The result of smoothing presented us 3 month moving averages of monthly contract earnings, and this is suitable from the view point of analytical effectiveness and calculation cost. The sum of 3 monthly hourly contract earnings adjusted by a seasonal variation index would be still better.

IV. The Method

We now have a number of time series of wages. We want to express the likeness among them quantitatively. We calculated correlation coefficients between all pairs as a relatively simple method. In this case we should mention the absolute level of coefficients is not a problem, but the relative level of it has meaningfullness.

V. The Result

(1) the correlation of 3 month moving averages of monthly contract earnings by sex and 46 prefectures, manufacturing, of production & related worker, from Jan. 1957 (92×92)

1. The coefficients of male workers are almost always higher than those of female workers.

2. The coefficients of developed areas such as the Kinki district are higher than those of underdeveloped areas such as Hokkaido and South-Kyushu.
3. The high correlation of female workers seems to be the outcome of the traditional textile industry.

(2) the correlation of 3 month moving averages of monthly contract earnings by sex and 20 manufacturing industries, of production & related worker, from Jan. 1952 to Dec. 1957 (40×40 coefficients)

1. The coefficients of male are almost always higher than those of female workers.
2. Tobacco and rubber industries show the lowest correlation.
3. Light industries and other chemical and paper industries show a high correlation among them, while other heavy industries present a close relation among them.

The above are a brief report on part of the findings.

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