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# Measurements of the Potential of Population Growth

*by Masaaki Yasukawa*

Western European countries experienced demographic transition after late nineteenth century. It was after the development of Neo-Malthusianism and from this time fertility started to show gradual declining trend in Western European countries. Especially after World War I, declining trend in fertility rate accelerated and though population size was increasing, as number of births exceeded number of deaths, they were starting to lose potential of self reproduction. This situation aroused the interest of the demographers of the time on the problem of how to measure population potentials and their major interest to solve the problem was concentrated on the method of estimation. In other words, when they found out that fertility and mortality is influenced by age-distribution, they tried to standardize three factors; curde birth-rate, curde death-rate and age-distribution, to evaluate the population potential. Their efforts are revealed in net reproduction rate of Kuczynski, R. S. or the demographic functions that determines stable population by Lotka, A. J.. These results appeared in the latter part of the 1920's.

On the other hand in the economic sphere, decline in fertility tended to accelerate the depression of the 1930's, in the latter part of the 1920's. This brought the publication of "General Theory" by Keynes. The close relationship between population growth and economic development under such circumstances made Hansen to write "Stagnation Theory" in 1939, and further in the 1950's it was developed into "Economic Growth Theory" by Harrod and Robinson. The efforts to overcome stagnation eventually became the problem of development of underdeveloped countries.

The purpose of the present study is to summarize the researches made on the problem of measuring the population potential. The present study first choose following three, voluntary age-distribution, the age-distribution of stationary population and the age-distribution of stable population for standard age-distribution. Next we explain the method of standardization of crude birth-death rate by each age-distribution. Secondly we mention that age-distribution of stable population is the most suitable one to be used as the standard age-distribution. Thirdly, we illustrate the relationship between

net reproduction rate and the intrinsic rate of natural increase. Especially we try to make it clear that those who assert that as net reproduction rate is based in the assumption of stationary population it is logically inconsistant are making false interpretation. We stress the importance of net reproduction rate as a rate of natural increase for one generation.

In the appendix we introduce "A New Method for Calculating Lotka's r- the Intrinsic Rate of Growth in a Stable Population" by Ansley J. Coale, *Population Studies*, Vol. XI, No. 1, July 1957 and illustrate the numerical examples.

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## The Structure of Capital-Distribution in the Business Corporations

*by Fumimasa Hamada*

In this paper, the author attempts to make clear a regularity in the structure of capital-distribution in the main business corporations belonging to the Japanese chemical industry. Many recent empirical studies on the investment behavior of business corporations have been developed after the fashion of deducing the equation of investment in plants and equipments, in various types of inventories and in others, derived from the basic hypothesis, and testing the statistical significance of these equations. But in spite of much exertion to make more precise the behavioral pattern of investments, there still remains a great deal of ambiguity or arbitrariness in the empirical results.

It is generally recognized that this is because of the simplicity imposed on the assumptions, such as no effects of relative price of capital to labor, psychological factors, technical innovation and so forth on the one hand, and because of the effects of changes in the financial conditions which restrain business corporations from raising internal or external funds, from outside directly or indirectly. Particularly, the author takes an interest in the regularity of proportions of investment in various types of assets, when the available funds are restricted within the level given from the outside.

As the most important assets to be invested in, the following four items are adopted; investment in fixed tangible assets, investment in inventories,



investment in credit-customers including the increase in notes and bills receivable discounted at the end of each period, and increase in cash on hand or in bank. It may, perhaps, not be unnatural that the former two can be considered as "positive" investment, while the latter two, as "passive" investment for the entrepreneur. The fact-findings which the author could finally derived from the observation in the post-war Japanese chemical industry are as follows:

First, investment in fixed tangible assets is linearly dependent on the sum of the available funds. The marginal propensity to apportion of the funds for investment in fixed tangible assets which the author has named, for the convenience, the ratio of increment of investment in fixed tangible assets to that of the sum of the available funds, seems to be considerably stable. Second, investment in inventories is linearly dependent on the sum of the available funds and the price of product in the preceding period. The marginal propensity to apportion for investment in inventories is stable with the product-price as given, while with the available funds as given, the product-price has the positive effect on investment in inventories. Third, investment in credit-customers is linearly dependent on the sum of the available funds and the changes in sales in the preceding period. The marginal propensity to apportion is stable with the changes in sales as given, and the increase in sales has the negative effect on investment in credit-customers with the available funds as given. This fact is very interesting in comparison with the fact that the product-price has the positive effect on investment in inventories. We could have an insight that there may be substitutability or preference between investment in inventories and investment in credit-customers subject to the short-run changes in the product-market conditions. Finally, the increase in cash on hand or in bank is linearly dependent on the sum of the available funds. The marginal propensity to apportion for the increase in cash on hand or in bank seems to be stable.

As the conclusion, it should be noted that the existence of the regularity dominant in the structure of capital-distribution does not deny the traditional theory of the firm, but rather supplement it. It is hoped that the theory to be able to explain these facts will be developed.