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SOME ASPECTS OF THE ECONOMIC INTERPRETATION OF CHANGES IN THE INEQUALITY OF INCOME DISTRIBUTION

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I. INTRODUCTION

THE literature of economics contains many works dealing with the problem of analysing changes in income distributions by size. On this subject the main interest has centered in the *formal* aspects of the problem. Different methods have been developed to make comparisons between two or more distributions and, especially, to measure the degree of inequality. Compared with the exhaustive treatment of these problems there is, however, one aspect of the analysis of distribution, which seems to be treated rather grudgingly. This is the kind of problem arising when the economists try to give an economic interpretation of distributional changes. The import of such changes is as a rule not at all self-evident.

In economic theory the concept of income equalization is usually associated with certain specific ideas. It is, for instance, often said that an equalization of incomes also means a levelling of people's standards of living. It is, further, often argued that an equalization of incomes will influence the patterns of aggregate consumption and, especially, that it will reduce aggregate saving. But, can we really give such interpretations to a decrease in the degree of inequality? The answer to this question is that generally we cannot. In fact, we have to be very cautious in interpreting the significance of distributional changes. Though this is a rather trivial remark and has been pointed out by several authors, it is well worth repetition. Distributional changes are often interpreted in a too superficial way.

Apart from the uncertainty always attached to statistical material, the difficuities of interpreting income equalizations in terms of changes in standards of living, welfare, real consumption, saving or other similar concepts, may be said to emanate from two sources. The first of these is the fact that the latter concepts usually cannot be looked upon as *uniquely* related to the concept of income. As a rule we cannot regard a person's standard of living, his welfare, his real consumption, etc., as determined by his income only; hence we cannot treat the distributions of these variables as uniquely determined by the distribution of income. There may be changes in the former distributions, which do not affect the distribution of income and vice versa. And this raises the question what conclusions we can really draw from the knowledge of changes in the income distribution.

The second of the two sources of difficulty in interpretation is the fact that all measures of inequality and other methods of comparison are formal constructions without immediate connection with economic theory. This makes it nearly always impossible to translate the inequality measures into economic terms, even if we fully disregard the above-mentioned lack of uniqueness in the conceptual relations. Each of the different measures of inequality is an expression for one and only one, special property of the distribution, but, as will be shown below, the properties expressed by the different measures have very often no relevance to the problem at hand. The reason is, obviously, that the inequality measures are constructed regardless of economic theory.

In this paper I will give some views upon the interpretation difficulties which originate from the two sources mentioned above. To avoid the intricate problem of defining concepts like standards of living, welfare, etc., I shall here confine myself to discussing the relationship between changes in income inequality and changes in the distribution and aggregate value of real *consumption*. The reasoning will, however, be valid in principle also for concepts like standard of living, welfare, etc.[1]

In Section II I shall touch upon the question of what can be inferred about changes in the inequality of real consumption from a knowledge of changes in the inequality of income. As this problem has been much discussed in the literature I shall here be very brief, putting the problem in a simple way and

[1] The much discussed problem of finding concepts of income that are adequate for the calculations may be looked upon as the problem of finding income concepts that are as far as possible uniquely related to the concepts, in which we are primarily interested (standard of living, consumption, etc.).

giving some examples of complications that have had great importance in Sweden.[1]

In Section III I shall discuss the possibility of using measures of inequality to draw conclusions about the effect distributional changes may have upon consumption patterns and upon aggregate consumption. In this section I shall sketch a new method of distributional analysis. Compared with the traditional methods this one has the advantage of allowing for a co-ordination with economic theory. It is constructed on the basis of the theory of consumption in its simplest form.

In speaking of incomes we shall here mean *disposable* income, i.e. incomes after taxes and social transfers.[2]

II. THE INEQUALITY OF INCOME AND THE INEQUALITY OF REAL CONSUMPTION

The distribution of incomes cannot be identical with the corresponding distribution of real consumption levels. Nominal income and real consumption are not identical concepts. In the first place, income is not the same thing as consumption even if both quantities are measured in nominal terms. There is a difference – saving. Further, nominal consumption is not the same thing as real consumption. The latter concept is, usually, defined by some index having the property of being invariant with regard to differences and changes in prices.

These differences between nominal income and real consumption are, however, not the only factors that constitute discrepancies between distributions of income and distributions of

[1] For discussions about the relationship between the distribution of income and the distributions of standards of living, welfare, consumption, etc., the reader is referred to, *inter alia*: D. S. Brady, 'Research on the Size Distribution of Income', *Studies in Income and Wealth*, Vol. XIII, New York, 1959, pp. 3–54; M. A. Copeland, 'Determinants of Distribution of Income', *The American Economic Review*, Vol. XXXVII:1 (1947); G. Garvy, 'Inequality of Incomes, Causes and Measurement', *Studies in Income and Wealth*, Vol. XV, New York, 1953, pp. 27–47; G. Garvy, 'Functional and Size Distributions of Income and Their Meaning', *The American Economic Review*, Vol. XLIV:2 (1954), Papers and Proceedings, pp. 236–53; H. Kyrk, 'The Income Distribution as a Measure of Economic Welfare', *The American Economic Review*, Vol. XL:2 (1950), Papers and Proceedings, pp. 342–68; S. Kuznets, *Shares of Upper Income Groups in Income and Savings*, New York, 1950; R. J. Lampman, 'Recent Changes in Income Inequality Reconsidered', *The American Economic Review*, Vol. XLIV, pp. 251–68.

[2] The economist's interest in income distributions is certainly not limited to distributions of income defined in this way. He may, for instance, sometimes be interested in the distribution of income before taxes and social transfers. The problems of interpretation arising in the analysis of such distributions are, however, quite different from those to be considered in this paper.

real consumption. In speaking about the distribution of income we usually have in mind its distribution among income receivers, families, households, etc. In speaking of the distribution of real consumption we often have in mind, however, how levels of real consumption *per head* or *per consumption unit* differ among families or households. From social or welfare points of view this latter type of distribution is, in most cases, the relevant one.

It follows from this that the distributions of income and real consumption may change differently. It is conceivable, for instance that because of changes in the composition of the income-receiving unit, the inequality of income distribution could increase at the same time as the inequality of the corresponding distribution of real consumption has decreased. This implies of course, that knowledge of changes in the distribution of income tells us little about the distribution of real consumption and its development, unless we have some information about saving, price movements and the number of persons (consumption units) who have to be supported by the income receiving unit. Unfortunately our knowledge about these matters is, as a rule, insufficient.

During the last two decades the inequality of the Swedish income distribution has progressively decreased. To form a clearer picture of the implications of this equalization process is, however, a rather complicated task, since it has been going on simultaneously with – and to a great extent also has been caused by – various changes in the population structure and in price relations.[1] For instance, there has been a pronounced diminution in the geographical variations in income levels, and this has doubtless meant a levelling of incomes. But this has happened simultaneously with a corresponding diminution in geographical *price* variations and the inequality of *real* incomes cannot, therefore, have been affected by this levelling process to the same extent as the inequality of nominal incomes. A similar effect has resulted from the important migration from rural to urban districts. The increments in the nominal incomes of the migrants have not meant corresponding increments in their real incomes, because not only income levels but also price levels have been higher in towns than in villages. An effect in the

[1] It should be observed that in the Swedish income distribution, referred to here, every adult unmarried person is defined as one income receiver unit. Husband and wife are, however, counted as only *one* income receiver unit, regardless of whether the wife has an income of her own or not.

opposite direction has resulted from the increase in the proportions of students and pensioners – two population groups usually having small current incomes but due to high dissaving a relatively high level of consumption. This increase has in itself tended to make the income distribution more unequal, but it is very questionable whether it has tended to make the distribution of consumption more unequal. Furthermore there have been important shifts in the price relations of different goods and these shifts have, probably, disfavoured the upper income groups. Finally, when discussing the Swedish income equalization we cannot neglect the rise in the proportion of women gainfully employed. This has obviously had an important effect upon the income distribution, but – unless we disregard the value of the household duties performed by married women – it has not had a corresponding effect upon the distribution of real consumption.

It should be stressed that most of these circumstances make it impossible not only to use the changes in income distribution as an unmodified index of corresponding changes in the distribution of real consumption, but also to say that the former changes would have brought *tendencies* – ceteris paribus – to alter the distribution of consumption in a similar way. It is obviously nonsensical to use the concept ceteris paribus in cases in which the changes in the income distribution are *caused* by events that in themselves are not consistent with the ceteris paribus premises. We cannot, for instance, say that the decrease in income inequality that is due to geographical levelling of incomes has tended to decrease the consumption inequality. For the geographical levelling of incomes is – at least to a great extent – conditioned by the geographical levelling of prices. And such price changes are not consistent with the ceteris paribus concept in this case.

It is evident that the interpretation of the formal analysis of income inequality in any realistic setting must involve careful considerations of the modifying effects of factors such as have just been noted. In the following section, where a quite different problem is to be treated, I will, however, neglect these difficulties and regard consumption as uniquely determined by the size of income.

III. THE FORMAL ANALYSIS AND THE THEORY OF CONSUMPTION

One of the basic reasons why economists have taken a great interest in distributional changes is that such changes are considered important for the consumption patterns in society. It is, for instance, usually believed that a decrease in the income inequality will tend to diminish the consumption of luxury goods, to increase the consumption of necessity goods and, especially, to diminish aggregate personal saving. In view of this it is remarkable that no attempts are made to co-ordinate the formal analysis of distributional changes with the theory of the spending of incomes.[1] In fact, the measures of inequality met in literature do not seem to be very well suited even to a purely formal analysis of income distributions.

Let us examine the common idea that aggregate personal saving will tend to be reduced by an equalization of the income distribution. This idea is, as is well known, based upon the hypothesis that the marginal propensity to save is an increasing function of income, i.e., that the Engel-curve of saving is concave upwards. Let us here accept this hypothesis without discussing its validity, and let us further assume that we can calculate exactly some measure of inequality, for example the concentration ratio (the Lorenz measure). We can then say that every transfer of income from one person with higher income to a person with lower income must be followed by a reduction of aggregate saving and also by a reduction of the measure of inequality. On the other hand it is *not* possible to say generally that all redistributions of income having a decreasing effect upon the concentration ratio also have a decreasing effect upon aggregate saving.[2] The measure of inequality gives us no unique expression for the concept of inequality that is of relevance for our theory of saving.

Studying the consequences of changes of the income distribu-

[1] For surveys of different measures of inequality and their properties see, for instance, D. B. Yntema, 'Measures of the Inequality of the Personal Distribution of Wealth or Income', *Journal of the American Statistical Association*, Vol. XXVIII (1933), and M. J. Bowman, 'A Graphical Analysis of Personal Income Distribution in the United States, *American Economic Review*, Vol. XXXV:4 (1945).

[2] That this is not possible in spite of the unique effect of a transfer from higher to lower incomes is due to the fact that we cannot regard all distributional changes leading to an unaltered mean income but to a decrease in the inequality measure as a result of a series of such transfers. Some changes must be looked upon as a combination of such transfers and transfers in the opposite direction.

tion upon an economic variable, say H, we might express the connection between this variable and the distribution function, say F, of the income receivers as follows:

$$H(F) = \int_0^\infty E(x)dF(x), \tag{1}$$

where x stands for income and E for a given function. In the example given above H would correspond to the per capita saving and E to the Engel-function of saving. If we instead let H denote the per capita consumption for some good, E will correspond to the Engel-function of this good. The following reasoning will be based upon the assumption that our interest in distributional changes is connected with a theory like that expressed in (1).

If we now have this theory and want to examine the properties of the function F, being of importance for our theory, we obviously have to study what characteristics of the function F follow from the integration above. These and only these characteristics are of interest for us. The same obviously holds true if we want to compare two or more income distributions. As objects of comparison we then have to choose those properties of the distributions, which are of relevance for the theory under consideration. It is, in fact, very uncertain whether the different measures of inequality have any relevance in this respect. They may be quite inappropriate. It is therefore necessary to have the theory in mind when choosing the methodology of comparison. It cannot be ideal to use a method constructed for other purposes and having no connection with the theory under consideration.

To illustrate this we may consider the following examples. Assume first all Engel-curves to be linear, i.e. of the form $A+Bx$. Then, all the integrals (1) would be of the form $A+Bm_1$, where m_1 is the mean value of the distribution. Consequently this mean value would be the only characteristic of the distribution of interest. If, on the other hand, all Engel-curves instead of being linear were polynomials of the second degree, $A+Bx+Cx^2$, the integrals occurring in (1) would be of the type $A+Bm_1+Cm_2$, where m_2 stands for the second order moment. Consequently, both m_1 and m_2 would be relevant characteristics.

We may now ask whether the usual measures of inequality may be interpreted in accordance with a theory of the type (1) above. Or to make this question more explicit: Can we formally write the definitions of these measures as integrals, where the expressions under the integral sign consist of two factors, one of which is the differential of the distribution function of the income receivers? And if this is possible can we, then, interpret the other factors under the integral signs as Engel-functions?

The answer to the first of these two questions is in the affirmative for some of the inequality measures, for example the relative mean deviation and the concentration ratio. These measures may be written:[1]

$$\int_0^\infty \frac{|x-m|}{m}\, dF(x) \text{ and const} \int_0^\infty \int_0^\infty \frac{|x-Y|\, dF(y)}{m}\, dF(x)$$

or

$$\text{const} \int_0^\infty \frac{\int_0^x F(y)dy}{m}\, dF(x) \quad \text{respectively}$$

The second of the two questions must, however, be answered in the negative. As is easily verified, the functions appearing in the formulae of these measures are analogies which we do not usually regard as consistent with those of Engel-functions. This fact means, of course, that the inequality measures cannot be ideal instruments of analysis, if we have as a starting point of our analysis a theory of the type (1), where E denotes an Engel-function. Let us, then, try to find a better instrument.

Searching for the properties of the distribution functions that are of relevance for the theory (1), in accordance with what is said above, we have to decide what characteristics of the functions follow from the integration in the right membrum of (1). If the Engel-curves are known this is a simple task. In the general case, however, where we do not know the form of these curves, the situation is different. Then it is impossible to say what characteristics are relevant for the theory and what are not, and we cannot specify the relevant characteristics more precisely than in equation (1). We can reach a more definite result concerning the characteristics only by a limitation of the generality. We have to make some restraints upon the class of Engel-functions to be considered. Such restraints may, naturally, be made in a great many different ways. In this paper we shall,

[1] Cf. H. Wold, 'A Study in the Mean Difference, Concentration Curves and Concentration Ratio', *Metron* XII:2 (1935).

however, restrict ourselves to considering the class of functions that are linear combinations of functions with constant elasticity.

To begin with the simplest case, let us first confine ourselves to Engel-functions having constant elasticity over all income intervals, i.e. functions of the type

$$E(x)=Cx^{e} \tag{2}$$

where C and e are constants. Inserting this function in (1) we may write this equation

$$H(C, e)=\int_{0}^{\infty} Cx^{e}dF(x) \tag{3}$$

This function H may obviously be understood as expressing the per capita demand for goods having the Engel-functions of the type (2). And, accordingly, if we compare the function H for one period of time with the same function for another period of time, this comparison will tell us how the change in the income distribution has affected the per capita demand for goods having unchanged Engel-functions $C\,x^{e}$.

The change of the function H may have two causes, *either* a shift in the general income level, i.e. a proportionate rise or fall of all incomes, *or* a change in the *structure* of the income distribution, i.e. a change in the concentration of the distribution around its mean. From a theoretical point of view it is always of interest to separate the effects emanating from these two sources. For the theory of distribution the effect emanating from the change in structure is of main interest.

Let us, for simplicity write OE for the operation $\int_{0}^{\infty} E(x)d$ and let H_i stand for the value of H in period i. Taking two periods of time, period 0 and 1, we may write the quotient of the corresponding values of the H-functions, H_1/H_0, as OEF_1/OEF_0, and this latter quotient may in its turn be considered as a product of two factors, as follows:

$$\frac{OEF_1}{OEF_0}=\frac{OEF_{01}}{OEF_0}\cdot\frac{OEF_1}{OEF_{01}} \tag{4}$$

where $F_{01}=F_0(x/k)$. Here k stands for the quotient between the means, m_1 and m_0, of the distribution at the period 1 and the period 0. F_{01} may accordingly be interpreted as the distribution function, which hypothetically would have existed in period 1, if all incomes had changed proportionally from the period 0, i.e. if the structure of the distribution had been unchanged.

The right membrum of formula (4) consists of two factors. The first one, OEF_{01}/OEF_0 is an expression for a hypothetical change in demand caused by a proportional shift of all incomes. This factor may be called the *shift effect*. The other factor, OEF_1/OEF_{01}, is an expression for a hypothetical change in demand, caused only by a change in the structure of the income distribution. Let us call this latter expression the *structure effect*. It is on this effect we shall now concentrate our interest.

On the assumption made above that all Engel-functions have constant elasticity, we can easily derive a general expression for the structure effect. Writing $Q_i(e)$ for the integral $\int_0^\infty Cx^e dF_i(x)$ and $P_i(e)$ for the quotients $\frac{Q_i}{Cm_1}$ the following equations hold good

(5)

$$\frac{OEF_1}{OEF_{01}} = \frac{\int_0^\infty Cx^e dF_1(x)}{\int_0^\infty Cx^e dF_0(x/k)} = \frac{Q_1(e)}{Q_0(e)k^e} = \frac{Q_1(e)}{Cm_1{}^e} \cdot \frac{Cm_0{}^e}{Q_0(e)} = \frac{P_1(e)}{P_0(e)}$$

Here $P_i(e)$ may be understood as the quotient between the existing demand per capita in period i for a good having the income elasticity e, and the demand for the same good, which hypothetically would have existed, if all persons had had equal incomes.[1] This function P(e) will, accordingly, give us information about how the dispersion of incomes affects the demand for goods with different income elasticities.

Up to this point we have assumed that the Engel-functions considered have been identical during period 0 and period 1. This assumption is untenable for periods between which a change in the price level has taken place. It is, however, easy to prove that a proportionate rise or fall in all incomes and all prices does not disturb the above interpretation of the structure effect. Suppose that all prices have risen in proportion a/1, and that in the meantime the mean income has risen in the proportion k/1.

[1] If all people have equal incomes, everyone must have the income m_i and the demand per head must then be $c\,m_i^e$.

Then the mean income m_1 equals km_0 and the Engel-function for period 1 may be assumed to have changed from Cx^e to $C(x/a)^e$. The quotient OEF_1/OEF_{01} may then be written

$$\text{(6)} \qquad \frac{\int_0^\infty C(x/a)^e dF_1(x)}{\int_0^\infty C(x/a)^e dF_0(x/k)} = \frac{Q_1(e)}{Q_0(e)k^e} = \frac{P_1(e)}{P_0(e)}$$

We may now ask what use we can make of these formulae. The answer to this question is as follows. Suppose, that we have estimated the income distributions for two or more years. We can then approximately calculate the corresponding P(e)-functions. These may be represented in a diagram with the variable e on the horizontal axis. From such a diagram it is easy to see the order of magnitude of effect of the change in the structure of the distribution on the demand for goods having Engel-functions with constant elasticity of different size. Say, for example, that the diagram for an e-value of 0.5 shows the P-values 0.8 and 0.9 for the distributions of two successive years. From this we may then infer that the change in the structure of the distribution has changed the aggregate demand for goods having the income elasticity 0.5 in the proportion 9/8. In this way the P-functions give us a method of studying the extent to which changes in the structure of the distributions have changed the demand for different goods.

The function P(e) has some general properties worth attention. P(0) always equals 1. The same holds good for P(1). This is quite in accordance with the fact that changes in the structure of the distribution cannot change the demand for goods having Engel-functions either of the type $E=\text{const.}$ or $E=Cx$. In the interval $3<e<1$, P(e) is always less than 1, while the opposite is true in the interval $e>1$. For an absolutely even distribution, i.e. if all persons have equal incomes, P(e) equals 1 over the whole e-scale. The derivatives in the points $e=1$ and $e=0$ have an interesting property. For the absolutely even distribution these derivatives are zero and for all types of distribution a transfer of incomes from one person to another with higher income has the effect of raising the values of the derivatives.

Our reasoning has hitherto been based on the assumption that the Engel-functions have constant elasticities over the whole income scale. Such Engel-functions must, however, be regarded as very special, and because of that we have good reason to ask what relevance the P-functions, calculated as above, have for more general cases. The answer to this question is that the P-function is of interest also if we consider a much wider class of Engel-functions than the one considered above, that is for the class of Engel-function consisting of linear combinations of functions with constant elasticity.

In order to prove this last proposition we can consider an Engel-function of the type A+Bx. We here assume that both the constants A and B are positive. If we calculate the structure effect OEF_1/OEF_{01} on the basis of this function, we get the expression, say S(e),

$$S(e)=\frac{A+B\ P_1(e)\ m_1{}^e\bar{a}^e}{A+B\ P_0(e)\ m_1{}^e\bar{a}^e}$$

where $P_1(e)$ is defined as above.

Writing s(e) for the quotient $P_1(e)/P_0(e)$ we can transform this expression into the following

$$S(e)=\frac{A+B's(e)}{A+B'},\quad \text{where } B'=B\ P_0\ (e)\ m_1{}^e\bar{a}^e$$

From this latter expression we easily infer

$$1<S<s \quad \text{if} \quad s>1$$
$$s<S<1 \quad \text{if} \quad s<1$$

In this way it is thus possible to derive limits for S(e) on the basis of the knowledge of s(e). The structure effect S is obviously situated in the interval between s and 1. This means that the structure effects read from a diagram of the P-function always deviate from 1 more than the structure effect emanating from an Engel-function of the type $A+B\ x^e$. Thus we get some important information about this latter effect. Say that we have calculated the P-functions for two distributions and that we have for a given value of e, say $e=e_1$, found the quotient $s(e_1)=P_1(e_1)/P_0(e_1)$ to be for example 1.05. This may then be interpreted in the following way. The change in the structure of the distribution has caused a rise in the demand for goods having Engel-functions A+B x, where A and B are positive. The size of this rise is greater than 0 but less than 5 per cent.

What has now been said shows that by the knowledge of the function P one may draw some conclusions concerning the structure effects for goods having Engel-functions of the type A+B x, the constants A and B being unknown but assumed to be positive. The exponent e was regarded as given. Naturally we can now go a step further and consider a case in which we wish information about the structure effect without knowing anything about the exponent e, except that it is situated within some given limits, say in the interval $e' < e < e''$. In this case also the P-functions will give us information. As is easily seen the structure effect S(e) cannot in this case differ from 1 more than s(e) does in that point of the interval $e' < e < e''$ in which its deviation from 1 is greatest.

The above argument may obviously be extended to Engel-functions containing more than two terms, but the details of such cases will not be considered here. They would obviously involve more complications.

Let us end this discussion with an example of how to use this type of analysis. Between the years 1935 and 1948 there occurred a considerable change in the structure of the Swedish income distribution. We may now ask what effect this change has had upon aggregate personal saving. Has it tended to increase or to decrease this saving and if so to what order of magnitude?

To answer this question we have to make some assumption about the propensities to save in the separate income classes. Let us here suppose that the consumption expenditures have varied with income in accordance with the equation $c=A+B\,x^e$, where c stands for consumption expenditure and x for income. A, B and e are supposed to be positive constants. It is obviously reasonable to assume e to be less than 1.

Looking at the above diagram of the P-functions, we find immediately that in the interval $0<e<1$ the maximum deviation between the two P-functions amounts to some few per cents only. In fact, this deviation is 0.03 and it occurs for $e=0.6$. This means, that – on the above assumption about the consumption function – the change in the structure of the income distribution has tended to increase aggregate consumption at most by 3 per cent. An increase of 3 per cent has occurred if the constants A and e have taken the values 0 and 0.6 respectively. For all other values of A and e the changes in aggregate consumption have necessarily been smaller than 3 per cent. This implies that the change in aggregate saving emanating from the structural *change of the income distribution* cannot have amounted to more than 3 per cent of aggregate consumption.[1]

As was mentioned at the beginning of this section the analysis above is based upon the assumption that a person's demand for consumer goods is *uniquely* determined by his income. But this assumption is obviously far from realistic and this may, perhaps, raise the question what relevance the above analysis really has. Does not the unrealistic assumption make it quite uninteresting? The answer is no. What is said above is only meant as an approach to distributional analysis (and obviously not to the theory of consumption), the merit of which is – in the author's opinion – that the distributions are transformed into forms that make it possible to express distributional changes in terms of *hypothetical* changes in demand for consumer goods. The lack of uniqueness in the relationship between income and consumption does not matter for this translation. For theoretically it is always possible to separate the 'structural effects' upon consumption from changes emanating from other sources[2]. When interpreting distributional changes in terms of hypothetical changes in consumption we are quite free to confine ourselves to regarding the former effect only. This one must always be present and it is certainly not made uninteresting by the fact that there are factors other than income that may affect consumption.

[1] Obviously this does not imply that such a change also means a small precentage when expressed in relation to aggregate saving.

[2] That is the reason why it has not been considered as necessary to base the analysis upon more complicated theories of consumption for example those constructed by Duesenberry, Modigliani, Katona and others.