EXPERIENCE IN MEASUREMENT OF WELFARE COMPONENTS AND THEIR REGIONAL IMPLICATIONS

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The paper relates the Swedish discussion and criticism of national accounting statistics, especially GNP, as a measure of welfare. It describes some results of recent Swedish attempts to find practicable measures of welfare components, i.e. the investigations of the Low Income Commission and of the Expert Group on Regional Development Research. In both cases the regional aspects of welfare are emphasized in the paper.

The results are presented as a sign of important needs for new methods and new systems of concepts in measuring welfare. The Expert Group has for instance in different ways tried to map and compare the "service structure" of separate parts of Sweden. The Low Income Commission has principally studied the position in Swedish society of low income recipients and has not been working particularly on the illumination of regional differences, but since different types of region are included as a background variable, the investigations also give certain measures of the regional aspects of welfare.

In the last part of the paper some of the risks that seem to be difficult to avoid in trying to use welfare measurements are pointed out.

0. INTRODUCTION

This paper originated in an invitation to say something at the 12th General Conference of the IARIW about the discussion in Sweden on "welfare measurements" and about the results that have emerged from the Low Income Commission (LIC) and from the investigations carried out for and by the Expert Group on Regional Development Research (ERU). These results have only recently come to hand, so that the experience which we can report is rather methodological in nature. The results are described in the way given by the Commission and the Expert Group. We have not tried to evaluate the methods used or discussed the accuracy of the figures.

The paper is divided into five sections. In *Section* 1 some of the deficiences of national account statistics in measuring welfare are described. *Section* 2 relates to the importance of regional aspects on welfare. *Section* 3 deals with general problems in selecting and measuring welfare components. *Section* 4 constitutes the principal part of the paper and describes, without any evaluation, some of the results of the investigations made by LIC and ERU. *Section* 5 contains a brief discussion of certain difficulties involved in the use of these more subtle measures of welfare.

1. THE DEFICIENCIES OF NATIONAL ACCOUNTING STATISTICS FOR WELFARE MEASUREMENTS

A lively discussion has been taking place in Sweden recently about the use of various aggregates in national accounting statistics. The main theme for argument

has perhaps been the gross national product (GNP) and changes in it. Most people agree that GNP with various breakdowns can be used fruitfully for short-run analysis. It is also used as a measure of the long-term growth in available economic resources, and as a comparative measure of the relative economic development of different countries.

GNP has also been used in various connections as a productivity and sometimes as a welfare measure for a society. The reasons are of course that a strong correlation has existed (or allegedly existed) between economic growth on the one hand and higher productivity and increased welfare on the other, while the GNP is also unique as a simple summary measure of the national economy.

Its use in these respects has naturally been strongly criticised, and a desire has been expressed in the public debate in Sweden to have available other total measures, which do not simply express economic but also social valuations. Proposals have also been made in the Riksdag (the Swedish Parliament) that new measures should be devised which elucidate more clearly the development of the welfare components in our society.

GNP has been sharply criticised, for example by a number of economists in the research department of the Swedish Confederation of Trade Unions, in connection with the most recent long-term study of the Swedish economy, which makes use of GNP and national accounts.

National accounting statistics as a measure of trends in welfare can be criticised on numerous grounds. Experts in this field are of course aware of their dilemma, which stems from two main causes. First, national accounting systems are generally designed with a direct analytical economic purpose in view, and economic valuation is essential throughout if they are to be consistent. It would therefore be extremely difficult to construct national accounts which also took into consideration more "social" valuations. Secondly, there is a clear imbalance between the statistical information available and the statistical requirements of the national accounts.

Some of the main points of criticism may be noted:

(a) *The absence of net estimates.* The calculation of depreciation to give a correct picture of the wearing out of the capital stock has of course always been one of the classical stumbling blocks in national accounts, and the question of capital losses in connection with internal migration has been raised in the debate on regional policy. Closely related to the capital consumption question is in addition the discussion about the utilization of natural resources and the justification for counting the whole of an increase in their exploitation as increased productivity.

(b) *The lack of a measure of environmental destruction.* One of the most serious objections raised nowadays against national accounting statistics as a measure of productivity and welfare is that they record the direct production effects of rapid technological change, but not its negative effects on society, and these are becoming increasingly evident. Certain of these negative effects have direct economic consequences, for example through increasing public sector outlays on cleaning, water purification, protection of natural life and the environment, etc. If these are not undertaken, the health and well-being of the population

may be affected, and in all probability it is impossible to measure or value these in economic terms. Certainly, there are positive non-measured effects too.

(c) *Deficiencies in the valuation of production and consumption by the household and public sectors.* Because of the lack of "data on the volume of employment" and the impossibility of valuation, it has proved necessary in national accounting to exclude productive work in the home from the estimates of production, income and consumption. It is fairly obvious, and has long been a matter for discussion, that in times when the activity rate increases an increase in production is recorded which is exaggerated from a productivity and a welfare point of view.

In the case of the production of the public sector which is collectively consumed, this is of course measured from the cost side and therefore does not reflect the development of productivity in the sector. It is also easy for double-counting to occur, when the "production-promoting" activity of the public sector is included in public consumption instead of being counted as input and cost to other sectors.

(d) *No valuation of leisure.* Since the national accounts record the production of goods and services, but not the use of time, an increased preference for leisure will be expressed as a reduction in output (and accordingly can even be regarded as a decline in welfare), unless complementary data about working hours are taken into account.

(e) *No regard to the distribution aspects.* In the last years, the social debate in Sweden has increasingly been directed towards questions of distribution and equity, and in this context the absence hitherto in national accounting statistics of data about distribution has been experienced as a major deficiency. This is true both of the distribution of income and consumption between different categories of individuals and of the regional distribution of productivity and various welfare components.

This criticism is not a new one. As seen from the examples above the debate resembles the discussion about national income statistics many decades ago. But it is now much more closely related to the development of aims and measures in social and economic policy. On all these points the desire for supplementary data has inspired attempts to throw some light on the dark spots. We shall place particular emphasis here on the fact that the welfare of individuals is influenced by the circumstances prevailing in their own particular region to such a large extent that welfare measurements must pay special regard to these circumstances. Part of the deficiencies in the national accounting system to which attention has been drawn here can probably be eliminated only with the help of improved information about the regional situation concerning various welfare components. The freedom of choice which individuals have as regards residential environment, work, services and leisure pursuits are examples of factors with a regional basis which can be quantified and used to supplement national accounting measures.

2. Increased Importance of the Regional Aspects

In Sweden as in many other countries the shift from an agrarian to an industrial type of economy and the growing importance of public services (such

as education and health) and their economies of scale have brought about a concentration of the population in urban areas. The rapid pace of this process of concentration has in many instances created special "large town" or "metropolitan" problems of both a short and long-run nature. In a country like Sweden, where the surface area is very large in relation to the number of people, the opposite type of problem also occurs, namely the "sparsely populated problem". The trend can be illustrated from the information that, while only 14 per cent of the population of Sweden lived in urban areas in 1860, the corresponding figure for 1965 was as high as 77 per cent. In the past two decades even the smaller towns in certain parts of the country have declined markedly, and the concentration towards the metropolitan regions has grown in strength. This means that the population is now shrinking in almost the whole of the area called Norrland (the Northern part) and also parts of central Sweden. It has given rise to the special problems of sparse population, and these are accentuated by the great distances between localities which are typical of these parts of the country.

The assessment of appropriate regional policy measures is hampered by the lack of knowledge about the economic and social basis for different measures and about their consequences, and we then run the risk of assessing differences in productivity and so on between localities mainly from the standpoint of business economics. However, a comprehensive economic calculation must also take into account the external costs, for example those that arise through the expansion of infrastructure and the destruction of resources and those that are imposed on manpower (removal costs, commuting, etc.). A comprehensive national economic calculation of productivity can thus give a different result from that of business economics.

When one considers the social basis for and the consequences of various measures in regional policy one has to admit that we have very little knowledge at present, at any rate in Sweden, about the preferences of individual persons, and accordingly we find it difficult to assess the measures from a welfare point of view.

Rightly or wrongly, we endeavour through the national accounts or certain parts of them to obtain answers to some of our information requirements. If this information is to be relevant, however, these accounts must be considerably expanded and/or supplemented by statistics of quite a different character.

3. Various Welfare Components and the Prospects of Measuring Them

The difficulties of summarizing in a single measure trends in the welfare of a group or a nation do of course constitute an old and classical theoretical problem which has been taken up by Pigou, Hicks and others. We shall not touch on that here. Nevertheless, the practical need for some measure has proved so strong that various attempts have been made to approximate to this ideal.

One such attempt is the concept "total consumption of goods and services by the population" which has been discussed in the working group on national accounts and balances of the Conference of European Statisticians. This measure includes private consumption, parts of public consumption and consumption undertaken through private non-profit bodies—such as education, health and

sickness care, social welfare, leisure and cultural services, religion—and enterprises' direct outlays for the welfare of their employees, an item which can be expected to become more and more important in the future.

If one begins with the concept of total consumption as a kind of comprehensive economic measure, its usefulness as a welfare measure can of course be expanded by providing detailed classifications and supplementary tables for both private and public consumption. To take some examples, tables showing the consumption of foodstuffs can be supplemented with information about the calorie, protein and fat content of diet per capita, travel costs can try to separate out commuting to and from work (which is not generallly an expression of any positive satisfaction of wants), and so on.

Even if a better total measure of trends in welfare could be successfully contrived, the distributive aspects still remain.

For some time now proposals have also been to hand for supplementing the international systems of national accounts with a system for statistics on the distribution of income and wealth. Even with this ambitious programme additional burning desires for supplementary data are still to be found. As indicated, interest in questions of regional distribution has for example grown markedly in recent years in Sweden. It is of course feasible to insert regional classifications in the systems mentioned above as well, but this adds considerably to the technical problems of calculation and of analysis.

Income and income distribution data are, however, inadequate as measures of differences in levels of living in different regions. Numerous other components also need to be elucidated, such as the housing conditions, access to hospital and other health facilities, access to a differentiated labour market, to educational and cultural activities, access to leisure pursuits, state of the environment, etc.

The research worker is always confronted with major difficulties, both theoretical and practical, when he comes to select the relevant welfare components and seeks to shed light upon them. If the welfare concept is interpreted in terms of "the degree of satisfaction of wants"—or consumption in the broad sense—we have to determine *which* needs are to be satisfied, and *how* and *when* they are to be considered satisfied.

An alternative definition of level of living has been formulated in terms of the individual's command over *resources* of money, possessions, knowledge, environment, mental and physical energy, social relations, security, and so forth, with whose help the individual can control and consciously shape his living conditions. Thus is it not simply a question of economic resources; other resource components enter into such a definition as well.

It looks very much as though a comprehensive explanation of welfare trends in a country (region, group) necessitates a variety of efforts to find measures of both "consumption" components and "resource" components. There is also a distinction of a similar kind between the concepts "level of living" and "conditions of living". Various measures of the level of living endeavour to reflect actual welfare, while conditions of living are intended to measure the possibilities open to the individual to achieve certain combinations of welfare components.

4. Some Swedish Investigations of Various Welfare Components

In this Section we report on the experience with various attempts that have been made in Sweden recently to measure welfare components. The investigations to be discussed form part of the elucidation of two contemporary sets of problems. One relates to the position in Swedish society of low income recipients, which has been the subject of a State Commission that has recently reported. The Low Income Commission (LIC) has not been working particularly on the illumination of regional differences, but since different types of region are included as a background variable, the investigations also give certain measures of the regional aspects on welfare.

The other complex of problems relates more directly to regional development in Sweden, where a lack of balance has more and more attracted attention in recent times. A number of studies which clarify these problems were presented in the course of 1970 under the auspices of the Expert Group on Regional Development Research (ERU).

4.1. *The Low Income Survey*

The LIC instructions were to examine the condition of low income recipients, but without prejudging the matter by specifying some given income threshold. The whole structure of incomes was to be surveyed. The investigation has then had to consider what information is necessary in order to provide the discussion of low incomes with an acceptable basis. LIC has therefore attempted to supplement the official statistics of income, which begin in principle from a *tax policy* income concept, with information which corresponds in part to a *trade union-political* concept of income, i.e., a concept which shows what the individual receives in return for his labour input, and in part to a *social policy* income concept, which can illuminate the consumption standards of individuals.

The LIC studies of income have been based principally on a special survey which was designed and carried out in collaboration with the Research Institute of the Central Bureau of Statistics. A representative sample of some 12,000 persons in the age range 14 to 74 was used, and information was obtained, via interviews and data collected from tax, insurance and social security registers, about employment, income, wealth, education, household size, health and social assistance. The use of these data was simplified by the common occurrence of the civic registration number. The data refer to the year 1966.

In order to get further knowledge on the conditions of low income recipients, the LIC has also sought to supplement its enquiry into income with certain measures of other welfare components which it was thought could shed light on the level of living of various groups.

The studies of the *structure of employment* have been based in part on various groups arranged i.a. by sex, civil status, and age. As expected, it proved to be the case that married men in the age group 25–54 have the highest proportion of gainfully employed weeks throughout the year, the longest weekly hours of work and the smallest proportion without gainful or with only partial employment. On the other hand, married women constitute a special group, with the lowest proportion of fulltime employment throughout the year and the highest

proportion of part-time workers in the population. The activity rate also varies rather markedly according to education. This is particular true of women, both married and single; the higher the level of educational attainment the higher the activity rate.

Activity rates have also been studied by different types of region, the classification which is of particular interest to us here. Large towns, medium-sized towns, small towns and rural areas have been distinguished, and on this classification it turns out that the activity rate varies rather insignificantly for both men and women between towns of various size, but is lower in rural than in urban areas.

The activity rate is of course of overwhelming importance for the *distribution of income* viewed in the "social policy" perspective mentioned above. Another of the LIC studies suggests that approximately half of the total spread of incomes depends on differences in gainfully employed times. In the investigation described here the main emphasis is, however, laid on the study of *wage incomes*, and in particular those of fit workers with full-time jobs throughout the year. The distribution of wage income for such workers has been examined with reference to the following variables: sex, age, civil status, education, geographical region, immigrant or non-immigrant status, branch of industry, and occupation.

Of these, *sex* and *education* play a predominant part in the distribution of wage incomes. To take an example, among these full-time employees in 1966 only 7.6 per cent of the men, but 43.2 per cent of the women has a maximum annual wage income of 15,000 crowns. The enquiry shows that the wage gap between men and women is greatest at the two extremes of low and high wage levels, and smallest in the middle ranges. The part played by education can be illustrated by the fact that among the employees mentioned of both sexes 1.7 per cent of those with higher education (with matriculation and its equivalent or longer educational preparation) had less than 15,000 crowns a year in wage income, while the corresponding proportion for employees with shorter education was 19 per cent. As expected, the association between income and *age* showed that the highest average income level was found among the middle-aged, and that the spread of wages increased with increasing age. It should be noted that this relates to cross-section data, and that a distribution of this kind can occur even if *no individual* receives a lower income with increasing age.

Among the remaining variables, *geographical region* is of particular interest to us here. The material demonstrates a higher wage level in the towns than the country, and a higher level in large towns than in the medium-sized and small towns. These differences are related in large measure to the different structure of education, and to some extent also to the sex composition of the population. To illustrate these relationships, we can mention that a calculation was used which applied the sex and educational composition of the large towns to the income data for rural areas. This gave a proportion of 22 per cent for full-time employees gainfully employed throughout the year in rural areas with annual wage incomes of less than 15,000 crowns, against the actual percentage of 23.9 and a figure of 21.6 per cent for annual wage incomes over 30,000 crowns, compared with the actual figure of 12.6 per cent. The biased composition of the

labour force in the large towns with respect to sex and education thus appears to be significant particularly for the proportion of highly paid employees.

Further refinements of the regional income differences can be obtained by studies which the LIC has carried out with the aid of regression models. This has made it possible to study income differences independently also of age and sector of the economy. The latter is obviously of great significance for the income structure of rural areas, since agriculture and forestry is a clear low wage industry.

In the regression models, the LIC used a somewhat different regional classification from that employed previously, in particular by separating out the metropolitan Stockholm area. It then emerged that the sole remaining differences of any significance between the level of wages in different regions refer to Greater Stockholm on the one hand and other regions on the other. While the previously observed differences in income between different types of region thus were associated in large measure with differing age, educational and industrial structure, in the case of Greater Stockholm there remained a marked difference in wage level compared with the remainder of the country. This residual difference in average wage amounted to almost 20 per cent for men, and somewhat less for women.

There is then some justification for perhaps arguing that these remaining differences reflect higher "productivity" in some sense, depending on the high degree of agglomeration. On the other hand, one must, in assessing the nominal income differences from a welfare point of view, also pay regard to the "expensiveness" of the area, which for an individual can be expressed in such things as long and costly daily journeys, abnormally high housing costs, and so forth.

As was mentioned earlier, the LIC has also sought certain measures of other welfare components than income. The study concerns "resource" components—health, employment and working conditions, education, economic resources, conditions when growing up, "political resources"—as well as "consumption" components—housing conditions, eating habits, leisure and recreation.

The resource components need not of course be regarded simply as means in relation to one another and to one overriding living standard goal. They can also be interpreted as goals or ends in their own right, such as good health, satisfactory employment, and so on.

As a frame of reference for an enquiry of this type one can conceive of an ideal situation, a description of "the good life". Because of the great difficulties which the definition of such a situation poses, the investigators have however refrained from this, and have taken instead as their starting point generally accepted conceptions of what constitutes "misfortune" or handicaps in various forms. Thus the components have been selected with a view to trying to "*elucidate and measure the occurrence of problems for the individual.*" Given the objective of the enquiry, that of providing a basis for political decisions, the enquiry has also concentrated on those problems that can be influenced by such decisions. The choice of components of the standard of living is thus linked to existing institutional frameworks. To reduce the risks in such a procedure, "political resources" have also been included as a component. By this is meant that one

wishes to try and measure the possibilities available to the individual for "protecting himself" against the institutions, and also the possibilities open to him to have new problems heeded on the political level and thereby to influence the shape of institutions.

The main body of material for the level of living survey consists of the results obtained from a comprehensive interview study which was undertaken in May and June 1968 with a sample of some 6,000 persons. The following variables, *viz.* sex, age, civil status, education, social group and geographical region, have been used as background variables for elucidating the demographic and social structure. On account of the smallness of the sample the LIC warns against far-reaching generalization of the results for small breakdowns. Here only some main results will be related, as illustrations of the combinations of variables that the LIC wants to analyze.

Health. Among various welfare components, health has in many connections been regarded as quite the most important, at any rate if health is defined in the wide meaning attached to it by the WHO: "a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity". It is of course difficult to get to close grips with such a wide-ranging definition, and it is even more difficult to obtain measures of health in this sense. If we were to be successful in obtaining them it would take us a long way towards being able to measure "welfare" or "level of living".

Even the measurement of health in the most restricted sense of "the absence of disease or infirmity" causes major difficulties. In its delineation of the state of health of the (adult) population the LIC has made use of the individual's own assessment of his health by including in the interview survey questions about illnesses, handicaps, and general state of health. For a *small* number of persons among those interviewed there was also a follow-up of the interview with a medical examination.

The results of the investigation will not be reported here, since no summary assessments are possible. We simply observe that for most illnesses no significant difference was found as to frequency between different types of locality. In some cases differences of this kind were, however, discovered, namely mental stress, ulcers and to some extent colds and chills, which were all more common in large towns than in small towns and rural areas. Evidence was also found that "wear-and-tear symptoms", such as pains in the locomotive organs, fatigue and nervous complaints were very much more common in lower than higher social groups.

Eating habits. Among the constituents of welfare the composition of diet occupies, on a global view, an extremely important place, since it is of such significance for people's state of health and well-being. In a country such as Sweden deficiencies in this regard are not generally conditioned by the lack of possibilities for obtaining a worthy diet but by ignorance or lack of interest in the question. This also came out in the LIC survey, in that the persons interviewed showed the least interest in the particular section that dealt with eating habits. Thus it is also possible that the results are in this case less reliable than in others. However, the investigation does show that the Swedish consumption of foodstuffs deviates significantly from the composition which nutritional experts recommend,

particularly through too small a proportion of vegetables and fruit and too high a proportion of sweetmeats, cakes and the like. There are no major differences between different types of locality in this regard, whereas clear differences do occur in the case of smoking and the consumption of alcohol. Both have their highest frequencies—for different sex and age groups—in the large towns and their lowest in rural areas.

Education. Education can be viewed as a resource component and as a consumption component, i.e., both as a means of achieving other goals, such as a certain job, a high income (investment), and as an end in itself (consumption). Numerous investigations using economic criteria, but with a variety of strategies, have tried to determine the profitability of investments in education. An assessment according to economic criteria alone does, however, imply that the community's objective in the education which it gives its citizens is to increase the resources of the community in the form of goods and services available in markets. This does not prevent education from being considered in addition as an end in itself.

The empirical investigation lays the main weight on pinpointing how the welfare component, education, is distributed in the population. "Level of education" on a seven grade scale, and "duration of education" in years are used as measures of education. According to the survey the duration of education was for the age groups under 30 on the average two and a half years longer than for the age group 55–75 and one and a half years longer than for the age group 30–54. On the other hand the difference between persons with differing social background was still almost the same as in earlier decades. However, as the investigation does not include those who were younger than 20 years of age in 1968 it cannot reflect the most recent reforms in the educational field. There was no particular difference in the average duration of education between the sexes except for the very highest levels. However, it has not been possible here to take into account the nature and vocational direction of the education, which would certainly have thrown up large differences between the sexes. Regional differences in education exist both as regards place of residence and the place in which persons grew up. The longest average period of education is found in both cases in the large towns, and the shortest in rural areas. The educational differences between those who have grown up in towns of various sizes are, however, less in the younger than in the older age groups.

Working conditions. Conditions at the place of work in particular constitute a component of the standard of living which is completely overlooked by the monetary measures. It is also an extremely heteregeneous component. For some individuals work is in itself a positive factor, whereas for others it is rather in the nature of a heavy burden that has to be endured. On the concrete level, the investigation tries to elucidate the groups which have bad jobs, in the sense that they are badly paid and/or unhealthy, risky or burdensome in some other sense. We might mention, as examples of the results, that they show nearly a quarter of all gainfully employed persons had very heavy jobs in physical terms, while a tenth of all gainfully employed people were continually exposed to "deafening" noise at the place of work. The enquiry has made comparisons between conditions at the place of work and state of health, and these show a

clear connection between working conditions which are bad in various respects and certain states of ill-health and fatigue. No regional analysis has been undertaken of this component.

Political resources. By studying this component the investigation is trying to discover what resources the individual has for being able to express himself in a political context and thereby to influence his own position and that of his group. How far do the political rights which are formally equal also involve the same *real* possibilities for protecting their interests, when one compares different categories of individuals? Apart from information about participation in elections, the study also shows such things as the frequency of membership and activity in political and trade union organizations, participation in demonstrations, proportions of the population which have protested formally or informally against decisions by authorities, and the proportions which consider that they themselves could if necessary complain or obtain help in complaining against some decision by an authority. The latter in particular is judged to be a variable that could point to the occurrence of *political poverty*, in other words a state of defenceless against the public authorities. While 45 per cent of the population in the age groups 15 to 74 considered that they could themselves complain, and 37 per cent thought they could obtain assistance to complain, 18 per cent of the population said they had not these possibilities. The proportion was largest among pensioners, housewives and invalids, particularly in the lowest social group. No major differences occurred in this respect between different types of locality.

Leisure and recreation. Leisure is a difficult component to handle in this setting, because among those who have the least "leisure" there are some who probably do not experience any real distinction between free time and working time. The wage earning group has a legal entitlement to vacations, and the vast majority also have their weekly hours of work determined by law; but large groups of the population are not affected by these laws, particularly self employed persons and domestic workers not employed for a wage. The enquiry was anxious to obtain some picture of the actual hours of work for all these groups.

For wage earners the concept of "gross working time" has been introduced. This comprehends ordinary hours of work, overtime, preparatory time, extra work, rest periods and travel to and from work. The "most common" gross working time (measured in the week before the interview) was 9–11 hours per day (for just over half of the employees), but a small group (2 per cent) had over 13 hours' gross working time. Compared with other groups of people actively engaged in economic activity, for instance farmers and other entrepreneurs, the average work time of employees is not, however, particularly long. Likewise, employees usually had an annual vacation but, according to the enquiry, 78 per cent of the farmers and 34 per cent of other entrepreneurs had no vacation at all during 1967. People engaged in domestic work (not employed for a wage) have also been asked about their leisure position, and it emerges that only about half had had a holiday from household work during 1967 or had a day off during the month preceding the interview. The use of free time for various activities has also been elucidated in the enquiry.

4.2. *The Expert Group on Regional Development Research*

In its report, entitled "Balanced Regional Development", the ERU endeavoured to delineate the major changes that have occurred in recent decades in the regional structure of industry and population in Sweden, and to analyze the reasons for these changes. It relied mainly on information taken from population censuses and other official statistics for the purpose of showing population and employment trends in different types of region and in various parts of the country. This illustrates the regional development pattern whose main features have been outlined in Section 2.

When it comes to capturing the underlying causes the empirical material is unfortunately much more sparse. Using a theoretical analysis of the problem as a basis, the ERU does however summarize the results of certain studies which elucidate the various location decisions which are taken in (1) the household, (2) the business, and (3) the public sectors respectively.

The first two sectors are thought of as making their decisions on private economic grounds. When, for example, a decision is made in the household sector to move from one region to another this is because it yields a gain in welfare (in the short or long run). This gain in welfare includes both increases or decreases in real wages and changes, positively or negatively interpreted, in non-price determined environmental factors of various kinds. Likewise, it includes an assessment of whether the costs of moving exceed the discounted wage gains.

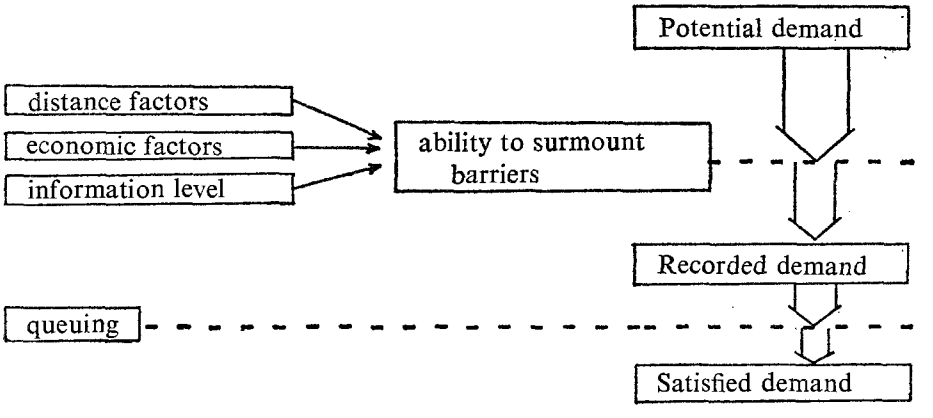
If we concentrate here on the choice of location in the household sector, which does of course reflect assessments by individuals of different regional welfare components, one can try to clarify certain of the factors which influence this choice. It has emerged clearly from various studies that the most important reason for mobility between different regions has been better employment prospects in the new locality. Choice of location in the household sector is therefore highly dependent on the location of the business sector and, directly or indirectly, on that of the public sector. On the other hand there is of course also dependence in the other direction. Interwoven with the employment factor are regional wage differences, which play a rather important part in the choice of location. Statistical material presented by the ERU shows here the same tendency as the LIC interview survey, namely that the large towns, and in particular the Stockholm area, have a distinctly higher wage position than the remainder of the country. This applies even if one tries, as the ERU did, to eliminate the effect of regional price differences, so that the comparisons can be made between real rather than nominal wages. This real wage superiority in the large towns may be an expression of an equilibrium situation, namely if labour, to take an example, places a negative value on the large towns' environmental factors and therefore prefers to remain in regions with lower wages. However, it is very difficult to estimate household preferences for different environmental factors, and in addition valuations differ from household to household. Some individuals set a particularly high value on the rich opportunities which the large towns offer for education, consumption and certain leisure pursuits, while for others these advantages cannot offset such disadvantages as lengthy travelling time and the lack of certain other leisure activities due to the heavy concentration of industry and people. Other factors which can reduce the propensity to mobility are removal

costs of various kinds—which can include some "social" cost—and the fact that the choice must often be made in ignorance of future conditions in different localities. Deliberations about moving are moreover complicated by the fact that the household cannot always, within the constraints of its economic resources, choose freely the consumption pattern that suits it best. One example of this is the housing shortage and the regulations for allocating the existing stock of housing which exist in various places. A variety of measures of housing shortage can be put forward, but none of these can claim to capture the whole problem correctly. It does seem probable, however, that the observed low space standards, high densities, and the low output of houses in the large towns relative to the population mean that the supply of housing does restrict increased migration to these localities.

A model of the household's choice of location can be constructed on the basis of standard consumption theory, which takes account of different factors that influence this choice: income, relative prices, uncertainty, rationing, environment, etc. The ERU has endeavoured to formalize a model of this kind.

In addition to employment and income differences there are thus a number of other regional aspects of welfare trends which are much more difficult to value and measure. In particular there are the major variations between localities in the supply of services and culture. The ERU has sponsored a number of attempts to elucidate such differences in various ways, and two of these will be discussed briefly here, as examples of different methods of tackling the problem.

Mapping the environmental structure. The starting-point for selecting those parts of the environmental structure which are to be recorded must be the needs which individuals may conceivably wish to satisfy. It may then be necessary to distinguish between potential, recorded, and satisfied demand. The relationship between these concepts can be illustrated by the following diagram:



In one of the studies an attempt was made to measure the possibility of access on the part of the individual to different utilities, with particular reference to distance factors. Because of a lack both of knowledge about the preferences of individuals and of data about supply, the study had to content itself with selecting certain areas of demand which are of evident major importance for

households and carrying out certain random tests in these areas. The areas chosen were medical care (including dental care) and information. The community has placed both of these in a special position by seeking to remove financial barriers to certain parts of the supply. However, geographical differences in accessibility mean that the supply is distributed very unevenly among the inhabitants of the country.

In the case of medical care, five indicators were analyzed, viz. access to a dentist, to clinics, optician, doctor and chemist. In every case the method was in principle the same. As a basis for the comparisons the country was divided into zones according to population base. For every locality the "local population base" was defined as the population resident within a radius of 30 kilometers. (Thirty kilometers was chosen because this was deemed a reasonable limit for daily journeys to and from the place of work). The supply of dentists can be taken as an example for the calculations of accessibility. First is given the number of dentists and the mean distance between them in various population zones, as shown in Table 1.

TABLE 1

NUMBER OF DENTISTS PER 100,000 INHABITANTS AND MEAN DISTANCE IN POPULATION ZONES, 1967

Population Zones (radius 30 km)	No. of Dentists	No. of Dentists per 100,000 Inhabitants	Mean Distance in km	Zone's Percentage Share of Total Population
– 10,000	54	23.3	68	3
10,000– 50,000	663	51.2	16	17
50,000–100,000	1,254	64.9	8	25
100,000–200,000	1,510	81.1	6	24
200,000–400,000	496	108.8	3	6
400,000–800,000	691	97.5	3	9
800,000–	1,553	126.2	1	16
Gotland[1]	27	50.3	12	1
Whole of Sweden	6,248	80.6	9	101

[1] Not included in population base calculations.
Source: SOU 1970: 17, app. 7.

These crude measures do not, however, take any account of the more precise distribution of population within the zones, nor of the nature of the demand. The main problem in assessing the latter is whether to be guided by some revealed (recorded) demand or to construct a normative (potential) demand, set at some hypothetically desirable level, irrespective of how consumers behave at the moment.

A normative demand appears most interesting in the analysis of an area such as dental care. As a fundamental assumption a level of demand has therefore been selected which varies precisely with the number of people, irrespective of income or present distance from supply points. Potential differences in the need

for dental care of various groups, for instance according to age, have not been introduced in the calculations. An intensity of demand per individual has been assumed which corresponds to the average supply throughout the country.

If one then compares demand and supply by area, one finds spread throughout the country islands with a local surplus of dentists, particularly in and around the large towns and main county towns. Other areas have a deficit. In order to obtain a more refined picture one can endeavour to measure the input of travel which is required for the hypothetical demand in different areas to be satisfied. With the aid of maps it can be shown in which areas a return journey of 50 km, 100 km, etc., suffices to reach a supply point with available capacity. (It has been assumed here that capacity is given, which is a correct short-term assumption in the case of dentistry). The situation can be summarized in Table 2, which shows the distribution of population by distance zones, *if* the total demand for dental care equals the total supply, *if* all individuals have the same need for dental care and *if* all individuals try to satisfy their needs.

TABLE 2

DISTRIBUTION OF POPULATION BY DISTANCE ZONES, ASSUMING EQUAL CONSUMPTION OF DENTISTRY BY ALL, 1967

Average Return Journey, km	Population, '000s	Percentages
0– 50	4,451	58
50– 100	650	8
100– 200	958	12
200– 400	1,084	14
400– 800	353	5
800–1,600	209	3
1,600–	11	0
Total	7,716	100

Source: SOU 1970: 14, app. 4.

The input of travel has also been recalculated on a time basis, which must however be based on the assumption that everyone seeking dental care has access to a car. This of course substantially underestimates the actual travel times, particularly in the sparsely populated areas where those without cars must rely on considerably more time-consuming means of conveyance.

The remaining supply categories in the medical care sphere which have been mentioned demonstrate on the whole a similar picture of differences in accessibility, with the exception of chemists. For these the position in sparsely populated areas is significantly better than for the others.

The investigation described here has similarly analyzed certain indicators relating to information, namely the accessibility of public libraries, special libraries of technology and natural science, class A bookshops, and the four-year technical institutes. The case of libraries can be taken as an example. Here the measures cover the travel input required to reach a major library, and also the input required to reach a library that had access to six recently published

TABLE 3

DISTRIBUTION OF POPULATION BY DISTANCE ZONES IN RELATION TO MAJOR LIBRARIES (CONTAINING MORE THAN 10,000 VOLUMES, AND OPEN MORE THAN 500 HOURS ANNUALLY) AND TO LIBRARIES WITH ALL SIX BOOKS ON THE SELECTED LIST

Return Journey km	All Major Libraries		Libraries with Access to the List of Books	
	Population, '000s	Percentages	Population, '000s	Percentages
0– 50	6,319	82	4,300	56
50–100	957	12	1,275	17
100–200	363	5	1,505	20
200–400	77	1	560	7
400–800	0	0	76	1
Total	7,716	100	7,716	100

Source: SOU 1970: 14, app. 7.

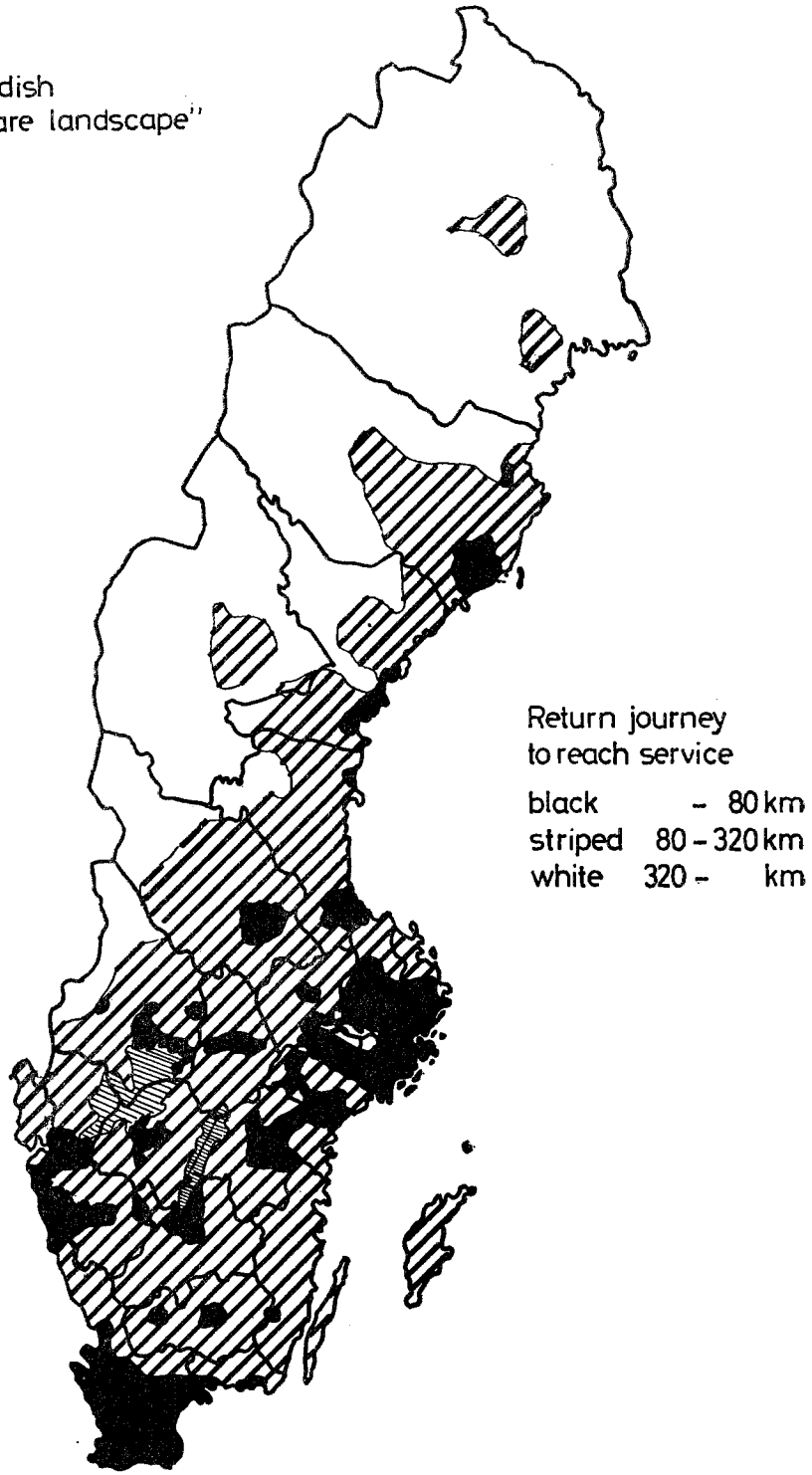
professional books, though not of an advanced scientific character. Table 3 shows the results.

Finally, it is worth mentioning that the investigation also comprises a weighting of some of the indicators that were analyzed, in an attempt to provide a synoptic picture of the structure of the environment throughout the country. Obviously the choice must be arbitrary. As long as we lack a well constructed theory for evaluating environmental structure there is no justification for weighting data that have been calculated other than on the most simple basis imaginable, that is to say by calculating arithmetic means. Two supply factors have been selected from the medical care and two from the information sides respectively—dentist, doctor, library, and technical institute. The result in a much simplified form can be seen from the map on page 183.

It should be noticed, however, that only such factors as give a positive picture of the central localities, particularly the metropolitan areas, are included in this "welfare landscape". Negative factors, such as for example long journeys to work, have not been included here.

On the other hand, special investigations have been carried out into travel-to-work in some localities of varying size. Thus the supply of workplaces has for example been calculated in various travel-time zones on the basis of points within the residential areas of Greater Stockholm selected by random sample, and these have been compared with the corresponding supply in a medium-sized town, Västerås. In rough outline the comparison can be said to show the following: Within a 20-minute zone the supply of workplaces is in most cases small in Stockhom compared with the central locations in Västerås. In the time-distance zone of 20–40 minutes there are for certain of the residential areas in Stockholm ten times more workplaces than are to be found anywhere in Västerås. From a more remote (but not extreme) Stockholm suburb (Hässelby) only a tenth of the workplaces are however accessible within this time interval, while the greater part of the labour market in Västerås can be reached even from the suburbs.

A Swedish
"welfare landscape"



Source: SOU 1970: 14, app. 4.

Even with a travelling time of more than one hour a third of the workplaces in Stockholm can still not be reached from Hässelby. Thus we can no longer consider that the Stockhom area constitutes a unified labour market, even with a commuting norm that is generous by Swedish standards.

Service networks in sparsely populated areas. Another method of attack has been employed to elucidate the service problems of certain areas in a comprehensive project labelled "Investigations concerning problems related to sparsely populated areas". This study is far from finished, but certain results and methods have been made available.[1] One of the questions to which a reply has been sought is what size a locality ought to be in a sparsely populated area if it is to function as a base for the supply of services.

A fairly comprehensive literature has grown up around the question of optimum size of locality and the minimum population needed for a locality to have an industrial and infrastructural environment such that it emerges as a spontaneous growth pole with a high degree of attractiveness and regional competitiveness. Some studies have found that a population of 30,000 to 40,000 constitutes a limit of this kind for growth centres. For a locality to function as a service base one can, however, presume that the limit is considerably lower. The first criterion used in this study was that a locality had succeeded in maintaining its relative position among the built-up areas in its county during a particular period (here 1950 to 1965). This then led to a hypothesis that localities with about 3,000 to 5,000 inhabitants have a sufficiently well equipped set of services that they can be said to have "hung on" in the development of the system of built-up areas and thereby maintained their rank in the hierarchy. Thereafter attempts were made to measure threshold values for those populations which are generally needed for various service establishments to be found in the locality. Sociological studies have been one of the means used to arrive at an aggregate of services the existence of which in a locality means that it can be regarded as satisfactory from the point of view of services. This led to the identification of localities with between 2,000 and 2,200 inhabitants as the size class which corresponded most closely to the criterion. In addition to this number it can be supposed that generally a certain rural population will be included in the purchasing power base of the locality. Different considerations indicate that an increase by about 30 per cent gives the indicated threshold value for the population. Allowing a margin as well for the rapid transformation of the industrial structure which is in progress and the accompanying depopulation of the rural population, the study has taken 3,000 as the population norm for a basic locality, giving a minimum standard of services.

An inventory of the built-up localities in the area studied which are of at least this size shows that they are very unevenly distributed, and that large areas lack a satisfactory coverage of services.

An additional attempt to illuminate the situation in sparsely populated areas with respect to services consists of a classification of the electoral districts in the area according to certain service characteristics. The electoral districts constitute the smallest administrative units—generally covering fewer than 3,000 inhabitants—and they have therefore been regarded as suitable for the purpose

[1] The study has mainly been confined to the northern counties of Sweden.

of comparing low levels of service. The electoral districts were then divided into eight classes on a scale which was considered to stretch from expanding to contracting areas, with the aid of a set of variables. The measure was constructed as a "sieve", whereby the electoral district to be classified is first assumed to be located on the highest position in a hierarchy, possibly to be "demoted" step by step thereafter, according to the values of the different variables. The following variables have determined the classification level:

1. Population structure, measured by the proportion of elderly people.
2. Retail services, measured by retail trade turnover in the area.
3. Proximity to the districts included in the top class.
4. Proximity to 15 listed public service establishments.
5. Proximity to four of the listed public service establishments, which were allocated special weights.

The district is assessed through the above variables being defined with the aid of a set of operational rules. Unfortunately, the results can only be shown with the help of detailed maps and tables, and so cannot be reproduced here. We simply mention that the districts, taken as a whole, are fairly well concentrated in the middle classes and that, if the different counties in the area studied are compared, the two most southerly counties have a significantly larger share of districts in the two highest classes than the remaining counties, while the two lowest classes are represented overwhelmingly in the three most northerly counties.

5. Risks of Using Welfare Measures

The investigations which have been discussed above exemplify different attempts that have been made to illumine human behaviour and the human condition with the aid of indicators which in part fall outside the concepts of "income and wealth". Their purpose is to seek a more detailed picture of the level of living of individuals, and in addition to try to shed light on the general "livability" of different localities, that is to say the qualities in a place which are significant for the conditions of the people who reside there. However, these somewhat more subtle measures of welfare do readily involve risks if they are used uncritically. The selection of the components which one is seeking to elucidate can never be objective, but depends on the valuations with which the investigator approaches the problem. In research into sparsely populated areas this has, for example, been expressed in the following way. "One possible source of systematic errors is the differences that may exist between the possibilities the investigators have of interpreting the valuations of the sparse population situation. It is likely that we approach the problem armed with a set of urban valuations, and we do not know whether these valuations determine the choice of variables".[1]

Here sociological interview studies are probably of great value in obtaining a background for the choice of components, and these have also been carried out, in particular when sparsely populated areas have been involved. Under the auspices of ERU a study has, for example, been undertaken in five areas of this kind and, for purposes of comparison, in one town in Norrland (Skellefteå).

[1] SOU 1970: 14, app. 2.

The aim of the investigations was in part to describe the existing situation of the population in sparsely populated areas, and in part to obtain the valuations of individuals of these circumstances. The questions related to such matters as working conditions, housing standards, and access to various kinds of service. The results demonstrated broadly, with respect to the variables that were investigated, that the inhabitants of sparsely populated areas in general found themselves in a worse situation than those living in Skellefteå. However, the interview also included a more general question: In present circumstances do you wish to remain where you are or are you willing to move? Despite the disadvantages, there emerged a very strong attitude in favour of remaining. On average, about 85 per cent of those in the five sparsely populated areas who were asked wished to remain where they were. The persons interviewed were also asked if they considered that government assistance to the sparsely populated areas ought to be directed to facilitating migration from them or to supporting services which made it easier to remain. Ninety-one per cent of those interviewed in the sparsely populated areas and 72 per cent in Skellefteå took the view that assistance ought to be directed to supporting those who remain. This attitude was somewhat more marked among the older than the younger age groups.

If, however, one has now defined a number of welfare components with the aid of valuations which have been precisely defined in one way or another, these components can be measured in various ways, depending on the particular aspect one wishes to highlight. In general, what different investigations have measured comes closest to being an aggregate or an average for individuals in the short run. On the other hand the elucidation of the following has often been neglected:

the distribution among individuals
the effects on the whole community
the long-term effects.

Recently, the distribution problem has, however, become more urgent and many examinations of welfare trends try to take account of the distribution aspects as well. This is true of those studies which have been discussed above, where the regional distribution in particular has been emphasized. As to the other neglected area, concern for the total effects on the community, wide and important fields for further research open up. One typical example of an area where a whole new series of studies of this type have already seen the light of day relates to developments in motoring. Car ownership is frequently used as an indicator of welfare—or perhaps more accurately of well-being—without being related to the aggregate effect which a large increase in the car stock has on various aspects of the life of the community. However, many attempts have been made in addition to calculate the total costs of motoring, not simply in the form of road maintenance and so forth but also for the care of the rising number of people injured in traffic accidents, the increase in air pollution, the loss of time on account of congestion in metropolitan areas, etc. Similar calculations are probably required—and in many instances are already in train—in order to discover the total effects of innovations of various kinds; these are far too readily regarded solely as a positive feature of the welfare picture, because little or nothing is known about their negative side-effects.

Total estimates of this kind lead to the third aspect, hitherto much neglected, which might be termed "the distribution of welfare through time". The question at issue here is how an increase in welfare in the present effects the welfare of future generations. Here there is a certain parallel with the life history of the individual. We surely do not nowadays reckon the well-being of the moment as a welfare component if we know that it has a negative effect on the future health of the individual (such as, for instance, drug abuse). A question seldom put on the other side is whether the "well-being" of our present society is drawing large or small blank cheques on the future. This does not relate simply to the direct exploitation of natural resources, such as iron ore, oil, etc., but rather to the whole range of our interference in the biological environment. Although we still put man in the centre of the scheme of things—without bothering about his surroundings for their own sake—it is essential, given the brisk tempo at the present time, to bring a consideration of the future into technical and economic progress as well.

Otherwise, the impoverishment and ecological change in what was previously an environmental balance may mean catastrophic set-backs for generations yet unborn.

We do not mean that economists should enter upon areas of research which they do not properly control; but perhaps it does no harm now and again to ask ourselves whether we may not be running the risk of biasing the description of reality by focusing attention on the components that are measurable—economically or in some other way—at the present time, and thereby misleading the public and the politicians. Are we not frequently neglecting to stress the conflict that can exist between economic growth and other components of the development of welfare, now and in the future?

What then are the prospects for our being able to meet the demand for systematic statistics that can shed light on welfare trends? Obviously, it is not possible to compress all the information required into one single framework, such as the National Accounts. A more realistic alternative is to retain the existing National Accounts, but to develop in addition detailed accounts and special aggregates and include these as *one part* of an information system for illuminating economic and social welfare. In the Central Bureau of Statistics in Sweden we have just started a comprehensive project which we call "Studies of Human Conditions"; this relates to investigations into statistical requirements and the study of the feasibility of satisfying them in areas that are of key significance for human conditions in Swedish society.

Obviously, a work programme of the kind sketched above is very expensive in terms of resources, and one of the difficult questions in this connection is to weight the inputs in these new areas against the inputs that are required, even with the existing National Accounts programme, to maintain and improve the equality of the constituent calculations.

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See in particular:

App. 2: E. Bylund—G. Weissglas: Glesbygdens servicenät (Service Networks in Sparsely Populated Areas).

App. 3: T. Åström: En sociologisk undersökning av fem glesbygdsområden (A Sociological Survey of Five Sparsely Populated Areas).

App. 4: T. Hägerstrand: Tidsanvändning och omgivnings-struktur (Time Usage and Environmental Structure).

and S. Öberg: En modell för beräkning av relationen mellan utbud och efterfrågan uttryckt i genomsnittlig reseinsats (A model for calculation of the relation between supply and demand expressed in average input of travelling).