THE SUBSTITUTION OF SELF-SERVICE ACTIVITIES FOR MARKETED SERVICES

BY JIRI V. SKOLKA

Austrian Institute for Economic Research, Vienna

This paper is divided into two parts. In the first part the consequences of permanent differences in the rates of productivity growth between economic activities are dealt with. Special attention is given to the substitution of self-service activities for marketed services. The former are tentatively defined as activities carried out outside the market having the following principal inputs: consumer's time, industrial products (mainly durables), and energy. The emergence of self-service activities challenges the conventional division of man's time into work for market and leisure, which should be replaced by a more detailed breakdown. Consumers' preference for self-service results mainly from high taxation, high real wages and equality in the distribution of personal income. Because of the growth of self-service activities in industrialized countries a non-negligible part of the population's productive effort will be difficult to record, since it will neither appear on the market nor have market value. The need to record self-service activities would be most strongly felt in statistics on private consumption, but would also have consequences in the measurement of the nation's welfare. One should make a distinction between consumption of marketed services and their self-service substitutes in order to provide information on the complementarity of the energy, time and material inputs into various self-service activities and on the substitutability between them and marketed services. This could perhaps be done with the help of extended commodity-private expenditure matrices. The recording as well as the valuation of non-market working time would probably cause great difficulties. Self-service activities are also becoming sufficiently important to warrant their inclusion in the debate on the measurement of the nation's productive effort and of the nation's welfare. But any recording of self-service activities would be a controversial measure since it would require recourse to imputations on a large scale.

This paper is a contribution to futurology in statistics. It contains comments on certain problems which economic statistics will likely face in the future due to profound changes in the economic structure of the industrialized countries.

In the first part of the paper the impact of unbalanced productivity growth on the development of self-service activities is analysed. In the second part, an attempt is made to outline problems this shift in the pattern of the economy will be likely to cause in economic statistics in the future.

DIFFERENCES IN PRODUCTIVITY GROWTH AND THE TREND TOWARD SELF-SERVICE

Economic activities differ in rates of productivity growth. Such differences are partly fortuitous ups and downs, but partly of a permanent nature. The latter allow the national economy to be divided into two sectors: one with permanently high and the other one with permanently low rates of labour productivity growth.

Unbalanced Productivity Growth

Several studies have dealt with the unbalanced productivity growth phenomenon. Baumol (1967) made a distinction between "technologically progressive activities, in which innovations, capital accumulation and economies of large scale all make for a cumulative rise in output per hour, and activities,

which by their very nature permit only sporadic increases in productivity". Baumol also assumed that nominal wages in the whole economy rise as rapidly as the output per man in the part of the economy with fast productivity growth and explained the financial difficulties of American cities caused by the large share of less productive activities in municipal demand.[1]

Differences in labour productivity growth also determine the pattern of price development and the mechanism of income distribution in small open economies (Aukrust, 1970; Edgren, Faxén, Odhner, 1973; Lundberg, 1972; Rigstad, 1972). In these studies the degree of foreign competition on domestic and foreign markets divides the economy into exposed and sheltered sectors, and causes substantial differences in productivity growth between them. It is also assumed, that money wages in both sectors rise roughly by the same rate.[2] Most of the quoted studies agree on the following two points:

(a) Economic activities can be divided into two groups, one with permanently high, the other one with permanently low rates of labour productivity growth.
(b) The rate of growth of nominal wages in both groups follows the rate of growth of labour productivity in the part of the economy with fast productivity growth.

Both hypotheses explain certain features of the postwar development of the industrialized countries, like the fast growth—in nominal, not real, terms—of private and public services (e.g. Fuchs, 1968; ECE, 1975), the tax burden, (which in some countries has reached levels the population is hardly willing to accept), or, last but not least, part of the post-war inflation (Nordhaus, 1972).

The first hypothesis, however, provides a strange vision of the structure of the economy in the distant future. Assuming the total available labour force in the industrialized countries to be almost constant over time and assuming equal real rates of the growth of output in both the productive and non-productive sectors of the economy, it is easy to show that labour would gradually be transferred from the productive into the non-productive part of the economy and that the productive sector would finally cease to exist. Such a long-term vision of the economic development can hardly be realistic, even if automatization of a large part of industry is taken into consideration.

The phenomenon of unbalanced productivity growth has several aspects, which can be treated separately. One could focus on one part of the low productive sector, namely public services, and investigate the danger to continued GDP growth caused by their rapid expansion, as well as on the deficiencies in the statistical measurement of public sector output, which relies on the value of inputs. In some activities, like health, education or research, the growth of their output is probably understated; in others, like public administration, overstated.

But one could also focus on another important part of the less productive sector, on private services sold on the market. Their fast growth in the post-war

[1]The problem put forward by Baumol was later discussed by several other authors and also empirically tested (e.g. Baumol, 1968; Bell, 1968; Bradford, Malt, Oates, 1969; Keren, 1972; Oates, Baumol, 1972 and 1974, Tullock 1974).

[2]A similar pattern of development was observed in Japan (Kuroda, 1974); the division of exonomy into sheltered and exposed sectors can also be found in a study on trade protection in Norway (Fløystad, 1974) and in the French (Aglietta, Courbis, 1969) and Finnish (MEPLAMO, 1970) planning models. One should also mention the theoretical study by Vogt (1973).

period led to overoptimistic predictions of their further expansion and of the nature of the presumably coming post-industrial society (Fourastié, 1950; Bell, 1973). Cross-section analysis of data on private consumption proved that the relative level of demand for private services is positively correlated with the *per capita* (or per family) income; the analysis of their time series has shown a link between the rise in the demand for private services and the rise in GDP. Both approaches, however, were not cross-checked, nor was it thoroughly investigated to what degree consumption patterns as well as income levels differentiate consumers between countries. A poor person in a rich country very probably does not behave like a person at the same level in a poor country (Lancaster, 1971): in the course of economic development low income groups cannot hope to achieve in future the present consumption pattern of the high income groups. "Economic prosperity does not automatically bring with it all the things that are usually taken to contribute to the quality of life and if it is accompanied by rising real incomes for all economic classes, it may be a positive detriment to such activities" (Oates, Baumol, 1972).

What is even more important is the fact that almost constant labour resources in the industrialized countries constitute an absolute constraint on the future growth of services, both public and private. And it can be expected that private services in this situation will, as a result of the rise in their price, vanish, partly or fully, from the market. The demand ("wants", "needs") for such services will, however, not disappear, but will have to be met by self-service activities.

Self-service Activities

The prediction that expensive private services will vanish from the market and will be replaced by self-service can be found in a few earlier studies (e.g., Baumol, 1968; Bell, 1968). Self-service activities can be tentatively defined as activities carried out outside the market and having the following principal inputs: consumer's time, industrial products (prefabricated materials and, mainly, household fixed capital equipment called durables), and energy. This broad definition encompasses *inter alia* the use of private cars for transportation of persons and goods; growth of self-service supermarkets; camping or renting holiday apartments; self-service in restaurants, flourishing of the do-it-yourself method in household repairs; use of radio and television sets, record players and tape-recorders instead of personal attendance of theatre performances, cinemas and concerts; self-service in the delivery in mail, etc. It should be noted, however, that some of these activities expand both because of the high prices of the marketed services and because of technological progress.

Three points are important for understanding self-service activities: the division of man's time, the economics of self-service activities, and their impact on the pattern and level of private consumption (and consequently, on certain concepts of the economic statistics).

The conventional division of man's time into work for market and leisure is being challenged for several reasons. Economists are now aware of the importance not only of the pattern of working time, but also of the allocation of total

time (Becker, 1965), and recognize that welfare depends not only on the amount of the marketed output, but also on the volume of non-market productive activities, or even on leisure (Nordhaus, Tobin, 1972). Among non-market productive activities the housewife's work receives particular attention (e.g. Gronau, 1973; Weinrobe, 1974).

It is becoming obvious that the partition of man's time into work for market and leisure should be replaced by a more detailed breakdown. One possible classification would be to consider, besides the work for market, the following three time categories: non-market productive activities, sub-divided into traditional and modern (self-service) activities, and (net) leisure, identical with free time activities and time for consumption. The two proposed alternative non-market productive activities differ in their degree of energy other than human power and industrial products (materials and durables) used.

The "economics" of the self-service activities should explain the shift of consumer demand from the marketed output of services in favour of self-service. The following three causes are likely to be important: differences in quality between marketed service and self-service, differences in factor utilization (and, consequently, in factor productivity) and differences in return on investment in durables or, alternatively, in the net remuneration for labour input.

Differences in quality between marketed service and self-service can hardly play an important role. Here and there self-service can be superior to marketed service, but cases of inferior quality of self-service are likely more frequent. (One should, however, not overlook psychological factors; some people might prefer their own amateur effort's imperfect results to perfect alternatives offered on the market.)

Factor utilization matters more. The sectors of the economy with slow and fast productivity growth can be roughly identified as "parallel" production processes and processes in "line" (in the factory), as defined by Georgescu-Roegen (1970). Differences in productivity between these two production systems are caused by the degree of idleness of production factors, which is much lower in the factory system. In industrialized countries labour is the relatively more expensive factor. Its low utilization in service activities, caused mainly by irregular demand (Winston, 1974), can be improved by a shift towards self-service, where labour input is provided only at the moment the consumer requires it (since it is provided by the consumer himself).

Consumers, however, need certain motivations to be interested in self-service. It could either be lower price or, in most cases, some kind of remuneration for their effort.

One possibility of evaluating the consumer's remuneration would be to consider the difference between the imputed price of the self-service on one side and the costs of material and energy inputs plus imputed costs of fixed capital (durables) utilization on the other side, as return on private investment in durables (e.g. Poapst, Waters, 1964; Juster, Shay, 1964).

Alternatively this difference could be considered as imputed remuneration for consumer's input of non-market working time and compared with the net remuneration for alternative work for the market or with the imputed value of leisure. In both cases the consumer's remuneration depends to a certain extent on

differences in per unit costs (in self-service and marketed service alternatively) of energy and other material inputs and of fixed capital utilization, (which in the majority of cases will all probably be slightly more favourable for marketed services), on subsidies (which could only stimulate the demand for marketed services) and, predominantly, on the taxation level (both of indirect taxes levied on goods and direct taxes levied on income), on differences in productivity (or factor utilization), on the level of gross profits and on the distribution of personal income. One of the latter elements, the tax burden, is linked to another aspect of the unbalanced productivity growth phenomenon, to the slow productivity growth in public services. All of the latter elements are more favourable in self-service activities. Summarizing, one can say that the consumer's preference for self-service results mainly from high taxation, high real wages and equity in the distribution in personal income.

Self-service Activities and Economic Statistics

Because of the growth of self-service activities in the industrialized countries statisticians will probably soon face a paradoxically similar situation to that in the developing countries. A non-negligible part of the results of population's productive effort will be difficult to record, since it will neither appear on the market nor have market value.

The recording of self-service activities in economic statistics would be most strongly felt in statistics on private consumption, but would also have consequences in the measurement of the nation's welfare.

Private Consumption Statistics

Statistics on private consumption record at present purchases of goods and services by households on the market (the minor exceptions to this rule are imputations of own-account consumption in agriculture and own-account rent from owner-occupied dwellings). Such data is obviously not sufficient for the evaluation of the volume, pattern and dynamics of self-service activities, mainly for the following reasons: no distinction is made between household investment in durables and purchases of short-lived consumption goods; between energy consumed (e.g. for heating or lighting) or serving as input for self-service activities; and, last but not least, no information is provided on the inputs of non-market working time by consumers.

These shortcomings are perhaps not grave at the present level of self-service activities (except, for example, in the case of personal transport). Assuming, however, their further expansion and the probable reduction of the duration of work for market as well, one has to question the usefulness of such data not only for the analysis of private consumption in the future, but also for its long-term projection.

A fairly simple change in current methodology, already proposed (albeit for different reasons) by several authors (e.g. N. and R. Ruggles, 1970; Kendrick, 1972), would be to include in the private consumption category only the consumption (costs of utilization) of the household fixed capital. The purchases of durables would then become a part of the fixed capital formation.

Another adjustment would be to make a distinction between consumption of marketed services and their self-service substitutes. Its aim should primarily be to provide information on the complementarity of the energy and material inputs into various self-service activities and on the substitutability between them and marketed services, and hopefully also to be able to understand better the process of displacement of certain goods from the market and the appearance of new goods. On a purely theoretical level the ideas put forward by Lancaster (1972) could be of interest; their full implementation in statistics, however, would be neither easy nor necessary.

Another source of an almost ready-made solution could be several disaggregated macroeconomic models (e.g. Stone, Brown, 1962; McCracken, 1973) which contain the "commodity-private expenditure matrices" (convertors). These matrices depict row-wise the commodity pattern of private consumption (which usually corresponds to the commodity classification of the input–output core of the particular model) and column-wise the pattern of private consumption by expenditure categories (for which consumption functions can be estimated). Such matrices could be adjusted to the analysis of self-service activities by enlarging the number of their columns in order to separate expenditures on marketed services from expenditures on their substitutes. The vector of the latter should then contain not only information on the costs of the use of durables, on energy costs and costs of other material inputs, but also on the input of consumers' non-market working time.[3] Such vectors would to a certain degree be similar to vectors of "consumption activities" (Lancaster, 1972).[4]

The recording of non-market working time would probably cause the greatest difficulties. But it can hardly be avoided. The three-way division of working time into work for market, traditional (subsistence) household activities and self-service, as proposed above (or any other similar classification of working time) reflects secular trends in the division of man's time. Subsistence and traditional activities prevail at low levels of economic development. The shift in favour of work for the market is caused by industrialization. At higher levels of development, however, preference for non-market working activities is increasing due to two different factors: durables transform traditional household work into more efficient modern "household technologies"—or self-service—and rising prices of marketed services stimulate interest in the self-service substitutes, for which inputs of non-market working time are needed.[5] The share of time allocated to work for the market has probably passed its peak in the industrialized countries and is going to decline further.

The minimum statistics should provide is information on the input of non-market working time in physical units (i.e. in man-years, or man-hours). To carry out such statistical investigations on a larger scale would however, require an

[3]Inputs of time involved in the consumption of marketed goods and services (Becker, 1965) are not taken into account.

[4]The treatment of the "own-account construction of dwellings, non-residential buildings and other projects by households and private non-profit bodies, as well as by government organs" in the SNA (paragraph 5.13b) is similar to the proposed treatment of self-service activities.

[5]These changes also partly explain the somehow paradoxical postwar opposite shifts in the allocation of the labour force, namely the exodus of housewives from households to the labour market on the one side and the general reduction of the duration of the work for the market on the other side.

agreement on the definitions of the self-service categories. Some of them can easily be defined; others, such as a few of those mentioned above in the tentative definition of self-service activities, lie on the demarcation line between work and hobby.

The valuation of non-market working time would be a more difficult matter. Its various categories would probably have different values, *inter alia* due to a certain type of joint production: "The input of time into many household activities is itself a direct source of utility or disutility to members of the household engaged in the activity" (Pollack, Walter, 1975). It is also a matter for discussion whether such a valuation should rely on the income from the main occupation of the person concerned, or on the hypothetical market value of the particular self-service; if the differences in labour productivity between professionals and amateurs are to be taken into account; and if enterprise profits and indirect taxes, included in the price of the marketed service, but saved by the consumer due to his personal engagement, should be considered.

Measurement of Domestic Product

It is not intended in this paper to join the now fashionable superficial attacks on the Gross Domestic Product or even to call this economic indicator nonsense (as certain economists, perhaps for publicity reasons, have from time to time). But proposals to make adjustments in the measurement of nations' productive efforts appear regularly on the programmes of IARIW Conferences. Self-service activities are becoming sufficiently important to warrant inclusion in this debate.

The United Nations System of National Accounts (1968) refers explicitly to transactions, i.e. to those results of productive activities, which appear on the market. A few exceptions from this rule are of minor importance. The accounting of the outputs of productive effort which are not destined for the market is, however, becoming serious because of the above mentioned trend in the allocation of time. Should this trend continue (as it probably will), the gap between the time-path of the nation's welfare and the time-path of the GDP indicator (Nordhaus, Tobin, 1972) will increase and could lead to errors in the assessment of economic development.

The main difficulty of any solution, however, is not of a technical nature. If necessary, statistics could provide rather reliable data on self-service activities. What is involved are theoretical and conceptual problems. Any recording of self-service activities would be a controversial measure since it would require recourse to imputations on a large scale. Imputations are disliked by statisticians; but the only two alternatives open would be to ignore self-service activities completely, or to try to estimate their volume in spite of any misgivings about such procedures.

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