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## Market and Nonmarket Service Production in Swedish Households

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# *INSTITUTIONAL CHANGE AND MACROECONOMIC PERFORMANCE*

## **2 MARKET AND NONMARKET SERVICE PRODUCTION IN SWEDISH HOUSEHOLDS<sup>1</sup>**

*by N. Anders Klevmarken*

For many persons, work in the labor market is perceived as the dominant activity in ones life. For Sweden, low unemployment rates and high female labor force participation rates strengthen this conclusion. A survey jointly made by researchers from Gothenburg University and the IUI in the winter and spring of 1984 showed that about 80 percent of the working age Swedish population was employed or self-employed, about 4 percent was unemployed and the remaining 16 percent was not in the labor force. For males almost 85 percent had a job, while 3.5 percent was unemployed. There were fewer females employed but the figure was still as high as 75 percent. Between 4 and 5 percent of the females were unemployed.<sup>2</sup>

The average weekly working hours for employed and selfemployed in their main occupation were in 1984 estimated to 36.7 hours. In Table 2 we find the corresponding figures by age and sex.

Excluding those who are above the normal age of retirement, the average number of working hours is about 40 for males, independently of age. For females the number of hours declines by age from 33 in the youngest age bracket, to 27 in the oldest. These estimates are based on survey questions about current, weekly working hours and they include overtime but only in the main occupation.

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<sup>1</sup> This article is based on data from the first three waves of the survey: Household Market and Nonmarket Activities (HUS), see Klevmarken (1984).

<sup>2</sup> These unemployment rates are somewhat higher than the official rates.

A time-use survey carried out at the same time gave lower estimates (see Table 3). Time-use data were collected in two interviews which were randomly allocated in the period February 1984 – February 1985. Table 3, however, only includes those who were employed (or self-employed) at the time of both interviews. In Table 3 results are given both for those who worked

*Table 1. Percentage employed, unemployed and not in the laborforce by sex in 1984 among those in the agebracket 18–64*

	Males	Females	All
Employed and Selfemployed	84.5	74.6	79.5
– fulltime ( $\geq 35$ h/w)	–76.1	–35.8	–55.5
– parttime ( $< 35$ h/w)	– 8.4	–38.8	–24.0
Unemployed	3.5	4.6	4.0
Not in the labor force	12.0	20.8	16.5
All	100.0	100.0	100.0

*Table 2. Average weekly workhours in the main occupation by age and sex 1984*

Age	Male	Females	All
18–29	39.5	33.4	36.3
30–54	41.8	32.2	37.4
55–64	39.5	30.4	34.9
65–74	30.0	(26.8)	29.3
All	40.7	32.2	36.7

*Note:* These estimates are based on a survey question about current average workhours in the respondent's main occupation and they include both paid and unpaid overtime. This question was only asked to those in the labor force who had a job.

*Table 3. Total weekly workhours by sex 1984 for fulltime and parttime employd and selfemployed in the agebracket 18–74*

	Fulltime	Parttime	All
Males	38.0	27.0	36.6
Females	31.2	21.9	26.5
All	35.7	23.0	31.7

*Note:* The estimates in Table 3 include marketwork in the main job as well as in additional jobs. Overtime is also included. They were obtained from a time-use study. The sample is restricted to individuals with a stable labor force connection (see text). Fulltime is defined as a response of at least 35 hours to a question about current workhours in the respondents main occupation. This question was asked in an interview preceding the time-use interview.

full time and for those who worked part time. The grouping of respondents into full and part time work was done with the help of a question about current working hours in their main occupation (see Table 2). This “core” of employed males and females had market work of about 37 and 27 hours per week respectively. The time-use study thus gives lower and probably more accurate estimates of the number of working hours per week.

All these figures support the idea that market work is a dominant activity in Sweden. However, in a life cycle perspective only a small part of our time is used for market work. In the early years about one quarter of our life is used for schooling and training and during the last quarter most people are retired from market work. Even if we limit our interest to the age bracket 18-65, only an average of 16 percent of our time is used for market work, a little more for males – about 20 percent – and a little less for females (about 12 percent). In this perspective it is remarkable that so little research has been done to explain and understand time allocation to nonmarket activities, and how these activities influence economic well-being.

### **What Do We Do during an Average Day?**

Tables 4a and 4b exhibit the time-use in 10 main categories of activities for Swedish households in 1984. The estimates in the table are estimates of the time allocation during an average 24 hours. By multiplication with 365 one obtains an estimate of the annual time-use.

The most time consuming activity is “Sleep and care”. Ten and a half hours were used for this activity. Of these almost eight hours were used for sleep and rest and one hour and twenty minutes for meals at home. Second largest is “Pleasure and recreation”, five and three quarters of an hour, which for instance includes watching TV and listening to radio and records. Market work takes three hours and twelve minutes, household work almost two hours and travel to and from various activities takes a little more than one hour.

For some activities there are quite clear sex and age differences. We have already seen that females use less time than males for market work. Swedish males contribute about 60 percent more to market work than Swedish women. However, females use almost three times as much time for household work as males. They also do more shopping and engage in care activities. They do not work as much as men with maintenance and repair of their houses and cars, they spend somewhat less time travelling, and have less time for pleasure and recreation.

Time-use in market work is inversely related to age. Older cohorts work less. They also travel less than younger people. Instead, they do more household work, spend more time sleeping and caring, in pleasure and recreation, and in maintenance and repair.

Table 4a. *Average time-use in hours: minutes for males by age in 1984*

Activity	18–29	30–54	55–64	65–74	All males
Market work and related activities	4:19	5:05	3:01	0:24	3:54
Household work	0:40	1:04	0:58	1:18	1:00
Sleep and care	10:02	10:00	10:22	11:37	10:19
Shopping	0:20	0:24	0:22	0:27	0:23
Maintenance and repair	0:32	0:44	0:49	0:61	0:45
Educational activity	0:26	0:05	0:01	0:02	0:08
Pleasure and recreation	5:57	5:04	7:01	7:49	5:57
Travel	1:31	1:20	1:08	0:55	1:17
Other communication	0:12	0:10	0:09	0:16	0:11
Other	0:01	0:04	0:09	0:01	0:06
Number of observations	194	661	188	168	1211

Table 4b. *Average time-use in hours: minutes for females by age in 1984*

Activity	18–29	30–54	55–64	65–74	All females	All males and females
Market work and related activities	3:05	3:06	1:55	0:07	2:31	3:12
Household work	1:49	2:56	3:22	3:34	2:50	1:57
Sleep and care	10:45	10:46	10:30	11:05	10:45	10:32
Shopping	0:34	0:31	0:32	0:39	0:33	0:28
Maintenance and repair	0:13	0:13	0:24	0:18	0:15	0:30
Educational activity	0:18	0:07	0:02	0:02	0:08	0:08
Pleasure and recreation	5:40	5:03	6:06	6:53	5:35	5:46
Travel	1:21	1:03	0:55	0:52	1:04	1:10
Other communication	0:13	0:14	0:13	0:15	0:14	0:12
Other	0:02	0:01	0:01	0:15	0:05	0:05
Number of observations	231	685	209	128	1253	2464

### Investment, Household Support and Consumption

Another way to structure the activities of a household is in the following three main categories: (1) Investment and maintenance activities, (2) consumption activities for personal pleasure and (3) intermediate service production. There are of course no clear borderlines between these groups, but the following is indicative. Sleep and rest, personal care, regular meals and educational activities make up most of the group called investment and maintenance.

It is not obvious that having a meal should be called a maintenance activity. It could also be a pleasure activity. Here only meals in restaurants, in someone else's home and with guests are counted as consumption for pleasure. On average, investment and maintenance activities take a little more than ten hours per day.

Consumption for pleasure includes the group "Pleasure and recreation" and travel needed for these activities. Average time-use for these activities amount to a little more than six hours. Again it is not obvious that pleasure and recreation activities are "pure" consumption activities. These activities, like sleep, might be needed to "recharge the batteries" for future work activities.

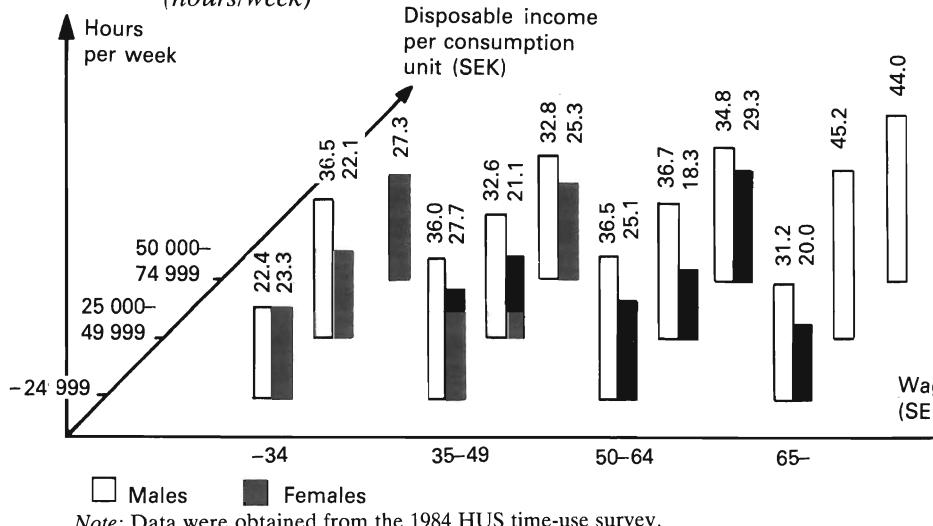
The final group includes activities which involve production of services needed for investment, maintenance or pleasure activities. Most of these services have market alternatives, i.e. at least in principle it is possible to buy these services from the market rather than to produce them within the household. Household work belongs to this group, as do child care, other care activities, shopping activities, repair and maintenance of one's house, car etc. Time-use in these activities amount to about 3.5 hours. Swedish households thus use as much time for service production within the household as they use time for market work.

### **The Theory of Time Allocation**

What explains the allocation of time to various activities? Economic theory traditionally assumes that each individual has an utility function which depends on the quantities of consumed goods and on time used for leisure activities. This utility function is maximized, subject to a budget and a time-use constraint. The total budget is the sum of earned and nonearned income after direct taxes, and earned income is the product of the number of hours allocated to market work times an hourly wage rate (after tax). Total time-use cannot exceed 24 hours. This model "explains" how time is divided between market work and "leisure". It assumes that market work is only chosen because it generates incomes which are used to purchase consumer goods. On the other hand the more time used in market work, the less time will be free for leisure consumption. The time allocation between the two activities depends on preferences, the (marginal) wage rate (after tax) relative to the prices of consumer goods and on nonlabor income. *A priori* we cannot determine the effect of an increase in the wage rate. The income effect allows for more leisure, while leisure at the same time becomes relatively more expensive and the substitution effect will make us work more. An increase in nonlabor income, however, will tend to increase both consumption of goods and of leisure.

Figure 1 shows how market work depends on wage rate and disposable income for males and females. The income measure is the sum of the incomes of both spouses less taxes and then divided by the number of consumption units per household. The wage rate variable is the current wage rate before tax in the main occupation. Following each “row” in the figure and thus holding income constant we find, that except for the lowest income bracket men who have a higher wage rate work longer hours. No such relationship can be seen for women.

Figure 1. *Market work by sex, wage rate and household disposable income (hours/week)*



*Note:* Data were obtained from the 1984 HUS time-use survey.

### Towards a More Realistic Model

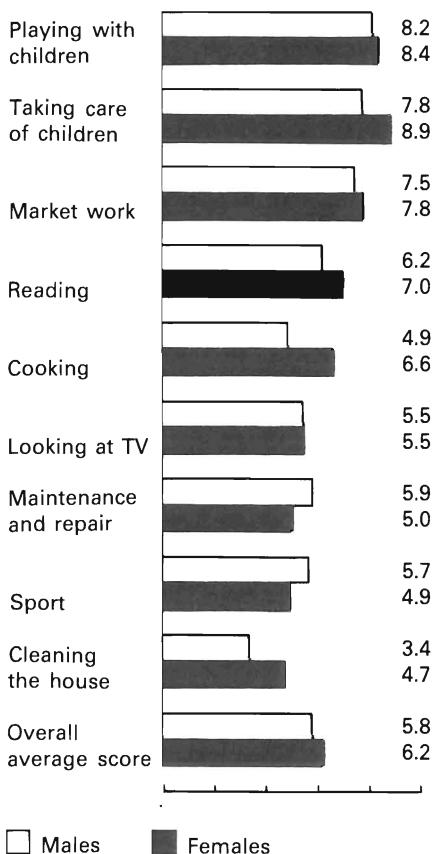
This simple model needs modification in several respects to become more realistic.

#### 1. Market Work Generates Utility

Market work should not only be modeled as a means to earn an income which is spent on consumption goods. It might as well be a utility generating activity. If so, it implies that other characteristics of the job than pay will influence not only job choice but also the number of hours used on the job. It is likely that a person is willing to work longer hours on a job that is interesting, agreeable and enriching than on a job which is not, provided the pay is the same. Next to “playing with one’s children”, market work is the most preferred activity among most males and females (see Figure 2) which indicates that many people derive direct utility from market work. In future research we will have to supplement the collection of labor supply data with

data about job characteristics other than pay, to determine how important they are relative to pay for the labor supply decision.

*Figure 2. Preference rating of selected activities by sex*



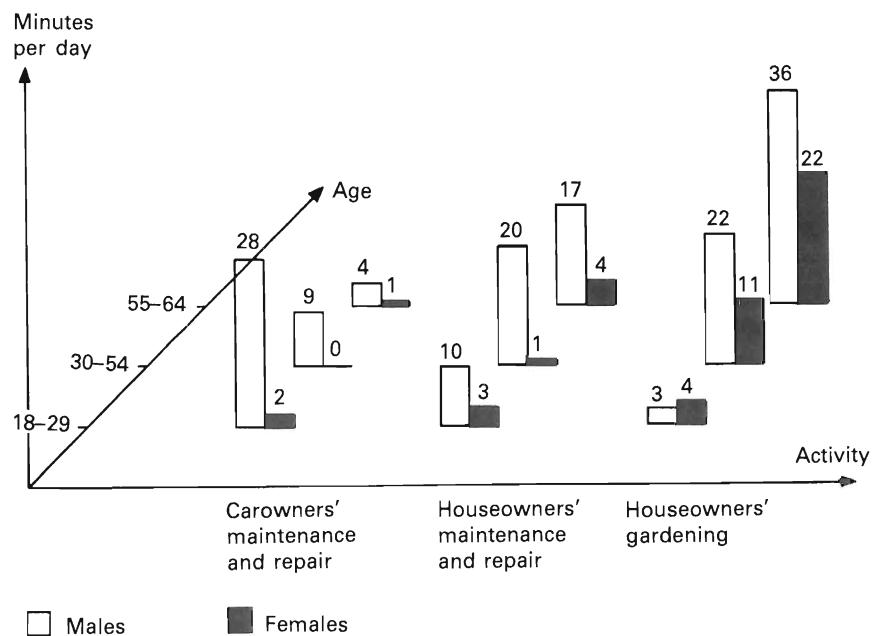
*Note:* The respondent was asked to set a score between 0 and 10 for each activity to indicate how much he/she enjoyed doing it independently of how useful the outcome of the activity was.

## 2. Car and Home Owners Need Time for Servicing Their Assets

Certain services can either be produced within the household or purchased in the market. The mix between these two possibilities depends upon how efficiently the demanded services can be produced which is a function of know-how and physical capital equipment in the household. For instance, to repair a car one needs to know something about the functioning of cars and one also needs the necessary tools. The mix between market and nonmarket solutions is also determined by the market price and the (marginal) net

wage. The higher the net wage the less is produced in the household; the higher the market price the more is produced within the household.

Figure 3. *Car owners' time-use in car maintenance and repair by sex and age (minutes/day)*



For car owners the first "column" of Figure 3 gives average time-use estimates in car repair activities by sex and age. For house owners the corresponding figures in repair and maintenance of the house and in gardening are given in the last two "columns" of Figure 3. To repair one's car is almost exclusively a male activity and it is mostly done by young men. The age effect could partly be the result of differences in human capital and partly an income and a wage effect. Older men are less experienced with cars and they also tend to have higher incomes and wages. That know-how is important for car repairs is seen in Table 5 which shows that those who have technical training use much more time repairing and servicing their cars than other groups. The fact that men with an academic training spend less time on cars than those with a shorter training might again be the result of their high alternative cost.

The maintenance and repair of an owner occupied house is also a typical male activity. Gardening is less so. Time-use in gardening is positively correlated with age, while middle aged men spend more time than other groups

Table 5. *Male car owners' time-use in maintenance and repair by schooling (minutes/day)*

Schooling level		Gymnasium and pregymnasium	Post gymnasium	All
Type of schooling				
General and unspecified	8	(0)	8	
Educational	(0)	6	6	
Social sciences	0	2	1	
Technical	24	6	22	
Farming	4	(8)	4	
Other	11	1	6	
All	14	4	12	

Table 6. *Male time-use in maintenance and repair by disposable income and wagerate (minutes/day)*

Disposable income per con- sumption unit (SEK)	Wagerate (SEK/hour)				All
	-34	35–49	50–64	65–	
<i>A. Maintenance and repair of owner occupied house</i>					
-24999	(21)	6	10	13	9
25000–49999	(68)	17	31	9	22
50000–74999	(99)	32	34	5	28
75000–	(0)	(0)	(0)	(6)	4
All	48	15	23	9	18
<i>B. Gardening</i>					
-24999	(4)	18	50	26	26
25000–49999	(11)	18	18	20	18
50000–74999	(0)	21	29	18	22
75000–	(0)	(112)	(0)	(5)	23
All	6	20	34	20	22
<i>C. Maintenance and repair of car</i>					
-24999	7	17	4	3	12
25000–49999	(13)	21	5	3	15
50000–74999	(14)	9	6	11	9
75000–	(0)	(0)	(0)	(0)	(0)
All	10	17	5	5	12

doing repair work etc. For these two activities the importance of the educational background is less clear, partly because of small samples. However, farmers and men with a basic general or unspecified education tend to use relatively more time for maintenance and repair.

The theoretically expected relation between the wage rate and time-use in service production activities within the household is not clearly revealed in Table 6. In some income brackets, but not in all, those who have a high wage rate use less time on maintenance and repair of their cars and owner occupied houses than those who have a low wage rate. But time-use in gardening appears to be completely unrelated to the wage rate.

### 3. Children Take Time

Time-use is influenced by certain ratchet effects which depend on previous decisions. For instance, couples who have decided to give birth to children have to spend time caring for them. Table 7 shows, that in families with one child the female uses almost 7 hours per week to care actively for her child. In families with two children, she uses 40 percent more time while still another child only adds another 10 percent. The pattern is about the same for the males although they spend about two hours less with their children per week.

*Table 7. Time-use by sex and number of children in the household (hours per week)*

Activity	Number of children				
	0	1	2	3	All
<i>Males</i>					
Market work	24.3	33.7	33.5	35.8	27.3
Household work	6.9	6.4	7.4	8.7	6.9
Maintenance and repair	5.0	5.3	5.4	7.0	5.2
Education	1.0	0.9	0.9	0.9	0.9
Pleasure and recreation	44.1	36.6	35.3	28.6	41.3
Travel	8.7	10.1	8.8	9.2	9.0
Other communication	1.3	1.3	1.1	1.2	1.3
Sleep and rest	55.9	52.3	51.6	49.0	54.5
Active child care	1.7	4.6	7.3	8.1	4.3
<i>Females</i>					
Market work	16.9	19.8	19.4	13.4	17.7
Household work	19.3	20.1	20.5	25.8	19.8
Maintenance and repair	2.2	0.9	1.0	1.7	1.8
Education	1.0	1.1	0.6	0.5	0.9
Pleasure and recreation	41.4	34.6	35.7	31.3	39.1
Travel	7.5	7.5	7.0	8.3	7.5
Other communication	1.6	1.6	1.4	1.6	1.6
Sleep and rest	56.6	55.9	54.3	52.7	56.1
Active child care	0.6	6.6	9.2	10.2	3.1

The number of children also influences other time-use decisions. One child or two children in the household does not influence the number of hours put into market work for either spouse (see Table 7). In families with three children, however, the female works less than the average while the male works more. In this case it is less profitable to use daycare services outside the household and the specialization of labor becomes more efficient. In families with many children both spouses work relatively more with household tasks and with maintenance and repair and have relatively less time for pleasure and recreation, and for sleep.

Although not irreversible, other decisions which influence time-use are those to acquire major durables like a house, a car, a yacht or a vacation house. It takes time to derive services from them and they also require time for maintenance and repair.

#### *4. A Constrained Set of Discrete Choices*

An analysis based on the assumption of marginal adjustments has only a partial validity. In the labor market there are limited possibilities to freely choose one's normal working hours. Most people might at best have a choice between fulltime, halftime and 3/4 of fulltime. One might, however, also influence normal working hours by taking more than one job. These decisions are usually more or less long-term decisions. The set of feasible choices depends both on the (local) labor market and on each individual's human capital.

For families with children, decisions to work in the market are also strongly related to the availability of childcare services. Supply of these services comes usually, but not always, in discrete bundles. A family is either able to obtain a place for its child or it is not. If there is a place, the number of hours can usually be adjusted to the needs of the parents. About 50 percent of all children in Sweden below 13 have their attendance at least for part of the day arranged outside their home; about 35 percent in the public daycare service. In families with two spouses, those who have more schooling are more likely to leave their children with a daycare home or a daycare mother than those who have less schooling.

An example of more short-time type of decisions is that of working overtime. These decisions may be of a more "continuous" character, but in most cases the initiative to overtime work comes from the employer and not from the employee. On many jobs it is also difficult to take a few hours off when needed. This means that neither a few additional hours of market work to generate the income needed to buy services such as car repairs – nor a few hours less of market work to get the time to fix the car at home – are feasible alternatives. Feasible alternatives are either to buy the services out of a given budget and give up something else or to use part of one's leisure to produce

these services. In both cases the wage rate and the marginal tax rate have no effect on the decision (cf. Table 6). It is influenced, instead, by the household's preferences for consumption and leisure, the price for these services in the market, the household's ability to produce them and its disposable income.

Would more flexibility in the labor market – permitting more variability in hours worked – result in more or less service production within the household? Theoretically both alternatives are feasible. This is an issue which needs empirical analysis in future research.

### **Additional Research Needed**

This review of household market and nonmarket activities has indicated that "traditional economic incentives" do play a role in household time-use, but the relationships are not always very clearly demonstrated. As the examples indicate, important constraints on behavior exist but they are not recognized in traditional economic theory. Since many of these "new constraints" might significantly affect household responses to, for instance, tax policies, further and more precise analysis is called for. The new HUS data set that combines economic data with time-use data will prove useful for this purpose.

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