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**Satellite Accounts on Household Production:  
Eurostat Methodology and Experiences to Apply It**

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**Abstract:****Satellite Accounts on Household Production: Eurostat Methodology and Experiences to Apply It**

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Household production, i.e. unpaid services produced for own consumption, is the most significant part of production which is excluded from the production boundary of national accounts. Measuring the value of these services is again a topical issue due to the recommendations of the Stiglitz-Sen-Fitoussi commission 2009 (S-S-F) that emphasise a wide production concept when measuring economic well-being.

In spite of the long tradition of studies on the measurement of unpaid household services, no worldwide consensus has been reached about the methodology. Moreover, many studies do not target the whole satellite accounts or the whole sequence of accounts, but instead value only the time used for household work. This practice gives an incomplete picture of household production.

It should be recognised that important methodological work has already been done. About ten years ago, Eurostat worked on this subject and established a task force. The proposed methodology is based on the framework of national accounts consisting of the whole sequence of non-financial accounts with all transactions from output up to net lending. In the methodology, the total value of service output is targeted rather than only the value of the labour input used in the work. When the whole production account including capital consumption and intermediate consumption is calculated, it is possible to compare structures of market and non-market activities, the value of non-market household services to corresponding market services, and finally, it is possible to add the household non-market accounts to official national accounts.

One interesting feature in the methodology is that household production is calculated by function in a similar way as government non-market services are calculated according to the COFOG in official national accounts. Examples of the functions are: providing housing, food, adult and childcare, and clothing care.

Our paper discusses the basic features of Eurostat methodology and experiences and challenges in its application. The choice in the valuation of unpaid working time is important. A great deal of research has been done that compares replacement cost, average cost and opportunity cost as the basis for the valuation. Of these alternatives, the opportunity cost valuation seems the least suitable in the national accounts framework – for employed people, household work can be understood as secondary work where the value of labour is usually determined solely by the skills required in the work rather than by other factors. A consensus on the valuation could and should be found.

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## 1 Introduction

Household production, i.e. unpaid services produced for own consumption, is the most significant part of production which is excluded from the production boundary of national accounts. Measuring the value of these services is again a topical issue due to the recommendations of the Stiglitz-Sen-Fitoussi commission 2009 (S-S-F) that emphasised a wide production concept when measuring economic well-being.

In spite of the long tradition of studies on the measurement of unpaid household services, no worldwide consensus has been reached about the methodology. Methods using outputs as the starting point are often claimed to be preferable in estimating the value of household production, but methods using inputs are applied in most studies. Due to the methodological obscurity, even these studies provide estimates produced using various options. A great deal of research has been done that compares replacement cost, average cost and opportunity cost as the basis for valuation (e.g. OECD 2010; Kuwahara 2010). The outcome is a confusing spread of values, for example, in relation to GDP, which undermine the credibility and usability of the estimates. Moreover, many studies do not target the whole satellite accounts or the whole sequence of accounts, but instead value only the time used for household work. This practice gives an incomplete picture of household production.

In Finland, too, we have a long tradition in estimating the value of household production. The first proper satellite account of household production inclusive of the whole sequence of accounts was compiled in Finland for the year 2001. It was updated for 2006. In the calculations, we followed the method developed in the European Union at the turn of the millennium. Finland participated actively in this development work.

In the final report of Sponsorship on Measuring Progress, Well-Being and Sustainable Development adopted in November 2012 in the European Statistical System Committee, Eurostat proposes harmonisation of household satellite accounts. According to the proposal, a pilot group of experienced countries should be created to propose a common European approach in compiling household satellite accounts. It is important that proposals already made in the European Union be made a starting point for this work.

Household production has also been recognised for its income generating aspect. The value of unpaid domestic services and the value of services from household consumer durables are included in the conceptual income definition of the second edition of the Canberra Group Handbook on household income statistics (2011) (to align with the 2004 International Conference of Labour Statistics standard). However, operational definitions are not provided because the definition of the SNA production boundary excludes them.

In this paper, we discuss the basic features of Eurostat methodology as well as experiences and challenges in its application. We present the results of the Finnish satellite accounts and try to point out the useful information that satellite accounts provide when they include the whole sequence of accounts. We address the questions of where agreements of common practices should be found and propose solutions to them. The questions deal with (1) whether to produce sequence of household accounts or to be satisfied with the value of unpaid labour (excluded from the core accounts), (2) how to describe and analyse household production, (3) whether to choose between the output and input approaches or use both, (4) how to value unpaid work, and (5) what wage concept and time concept would be preferable in the valuation.

The paper is organised as follows: we start by describing the European method developed by Eurostat task force, then discuss the method of valuation and issues related to it. We continue by presenting the work done in Finland where Eurostat method was applied, the results that include the value of services and extended sequence of accounts. Next, we reflect on some examples of ways of using the results and conclude by summarising the focal points.

## **2 What has been done in Europe: Description of the European method for the Household Satellite Accounts**

The methodology for the household satellite accounts was developed actively in the latter part of the 1990s, mainly sponsored by Eurostat. Two proposals were produced. The first one focused only on the input approach (Varjonen et al. 1999) and the second considered both the input and output approaches (Household production... 2003, task force report to Eurostat). The latter was a stage report. It included some discussion that has not proceeded further, for example, about making accounts based on physical quantities such as in social time budgets, about the output method applied in the UK's household satellite accounts that was dismissed after the experimental accounts were produced. The task force report, therefore, left open many questions providing only alternative

solutions. The input-based method has been applied in some countries, e.g. Finland, Germany, Spain and Hungary (Varjonen & Aalto 2006; Schäfer 2004; Duran 2007; Szép 2003).

These proposals were unanimous on the *scope of the household satellite accounts*: they should include all household production, goods and services, whether included in the SNA or not. Thus, the accounts give a comprehensive picture of all productive activities carried out by households. The SNA production for own consumption includes two main categories: housing services of owner occupiers and food items from agricultural production, as well as home gardens, and berries or mushrooms picked and game from the wild nature. The values of these products could be drawn from the core national accounts.

The proposals also agreed that the accounts should include *production account*. This means that in addition to the value of labour also capital consumption and intermediate consumption should be estimated. This is possible when household final consumption expenditure of the core national accounts is reclassified into intermediate consumption used in household production, investment goods of household production and goods used in direct consumption of households. The whole sequence of accounts and the needed modifications to the SNA household accounts are easy to compile after this reclassification and the production account are accomplished.

The proposals were not unanimous in how *household production could be described or categorised*. The Varjonen et al. (1999) proposal applied a principal functions concept to household production. The idea of the principal functions concept can be compared with the national accounts functions of government (COFOG, Classification of the functions of government). The main functions of production were

- providing housing
- providing meals and snacks
- providing clothing (incl. laundry and clothing care)
- providing care (children, adults in need)
- volunteer work (informal and unpaid help to other households and organisations).

The principal functions are based on the vital tasks, also called life care services that households themselves are mostly responsible for. Only when a household is not able to provide these services, the community gives a hand in it. All activities that contribute to housing, such as maintaining the dwelling /house, making repairs, taking care of the yard, mowing, etc., are included in the housing principal function. Transporting children or driving for grocery shopping are included in the

function that the transport is needed for, e.g. child care or food, etc., In a similar way, e.g. shopping for clothing is included in the providing clothing function.

Table 1. Principal functions of household production

	<b>Providing housing</b>	<b>Providing meals and snacks</b>	<b>Providing clothing and clothing care</b>	<b>Providing care</b>	<b>Volunteer work</b>
Principal activity	<i>Purchase of housing</i> <i>Own-account construction and renovation of dwelling</i>  Decorating, cleaning and maintaining dwelling, maintenance of yard, gardening  Small repairs and renovations	<i>Growing foodstuffs, picking berries, mushrooms, etc., hunting and fishing</i>  Preparing meals and snacks  Baking, preserving.	Production of clothing  Washing and ironing clothes.  Repairing clothes and other care	Childcare  Care of adults in need of help.  Caring for pets	Neighbourly help  Voluntary work in organisations
Shopping	Purchases related to renovating, maintaining and cleaning dwelling.	Buying groceries Buying appliances and utensils for cooking	Buying clothes, buying materials and equipment for making clothes and their care Buying shoes	Buying equipment related to childcare and caring for adults in need of help.	
Travel and transportation Vehicle maintenance	Travel related to acquisition and maintenance of dwelling.	Travel related to buying groceries.	Travel related to buying clothes and their care.	Transporting children and adults in need of help to care, hobbies, etc.	Travel related to volunteer work.
Household management	Planning and organising activities, services, banking, etc, apply to all principal functions.				

Productive activities included in the core national accounts are shown in *italics*.

The principal function approach has been adopted in the satellite accounts of the UK, Finland, Australia, Spain and Hungary. It is very helpful when the output method is applied, especially because the outputs of household production need to be defined accurately. Moreover, in applying the input method, if the outputs are defined it makes it easier to separate intermediate consumption from final consumption. The market sector and non-market sector (government and non-profit institutions serving households) provide similar services to households as households themselves

do. Households tend to decide separately on buying meal services, clothing services or care services, for example. The grouping facilitates comparison between market and household production at a more detailed level than just as a total sum that is called “a bulk of housework” or “routine housework”.

### **3 Output and input approaches**

The preference between the output and input methods is often set to the output method - in theory. The main reason for this is that the output method is the one that is used when calculating market production in national accounts. Therefore, it gives possibilities for making comparisons with the activities in market production. The output method also makes the measurement of the productivity of household production possible.

Economists such as Duncan Ironmonger and Andrew Harvey have spoken for the output method and made proposals for practical solutions to data gathering and calculations (Ironmonger & Soupourmas 2009; Harvey & Mukhopadhyay 1996). The UK developed output-based experimental accounts of household production, which were unfortunately dismissed after a few years of production (Holloway et al. 2002).

In practice, data collection for the output method is very expensive. Most other studies have applied the input method, which obviously is the result from the availability of time use data in many countries. Although time use studies are also expensive, they have many usages for different kinds of purposes. This is why, in practice, the input method is more realistic to carry out than the output method. The available time use data have made it easy to value unpaid work time by a suitable wage or wages.

The output approach differs from the input approach much more than just in that the counting rule is reversed and the value of labour is estimated as a residual. There are differences in how to define outputs, e.g. travel and transport, and which inputs should be taken into account. Therefore, the output method needs guidelines of its own.

However, the input method also needs common practices to give comparable results between countries. It may be tempting to make comparisons even with very weak data and call them experimental (e.g. OECD 2010) but the results do not tell much of the real value of unpaid work in

the countries in question<sup>1</sup>. A careful comparison was made between Germany and Finland. Originally, Germany used net wages and Finland gross wages. When the wage concept was made the same, the difference in the values narrowed clearly and the rest of the difference could be easily explained (Rüger & Varjonen 2008).

A great deal of discussion has gone on about the valuation methods through the decades starting from the 1970s. Just to mention a few, Hawrylyshyn (1977) Goldchmidt-Clermont (1982), Jackson (1996), Varjonen et al. (1999) have presented the pros and cons of different methods: replacement (generalist, specialist, average wage) and opportunity cost. Most researchers agree that opportunity cost is not appropriate for the purposes of satellite accounts. For employed persons, household work can be understood as secondary work where the value of labour is usually determined solely by the skills required in the work rather than by other factors. The opportunity cost method yields different values for similar products depending on who performs the task, e.g. the imputed value of ironing a shirt by a business manager would be much higher than that by a clerk. The opportunity cost method may, instead, be relevant in individual economic studies applying the utility theory.

## **4 How to value labour**

### ***4.1 Which wage should be used?***

Replacement cost can be based on generalist's or specialist's wages. Which one is selected depends on the national practices in outsourcing unpaid work. The use of generalist's wages is an easier way to calculate the value, because it includes almost all kinds of work that is done in households. The use of specialised worker's wages needs more decisions about how to define the standards for the work done at home. The decisions needed are e.g. whether to use the wage of a cook or a kitchen helper, the wage of a nanny or just a baby sitter, or whether to divide the specialists' tasks according to standards: some of the work requires cook's standards (planning the menus, deciding on the purchases of ingredients), and some kitchen aid's standards (such as making up the dishes).

A frequently discussed question is whether quality adjustment is needed when specialist's wages are used. The US guidelines recommend it in order to take into account the difference in the skills and efforts between market and non-market (Abraham & Mackie 2005, 32). Landefeld et al. (2009, 218, 223) have applied this in their calculations for the US accounts for household production.

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<sup>1</sup> For instance, all unpaid work in Finland had been valued by the informal baby sitters' fees.

Salamon et al. (2011, 226) who examined the value of volunteer work comment that no exact scale for such adjustments has been established. They add that while some volunteers may have lower skill levels than a typical paid worker, others may possess higher or unique skills that offer a premium over paid workers (229). Varjonen et al. (1999, 26) emphasise that skills develop with repetitive housework and finally make men and women professionals in managing their own households. The examples that are often presented to prove the opposite concern seldom performed tasks such as fixing of a leaking tap (SNA2008, 29.150). However, leaking taps are fixed by amateurs far less often than, for example, houses are cleaned or meals prepared. All in all, it should not be taken for granted that people are amateurs in household production. Research is needed to get this problem solved. Before that, we prefer not to make any adjustments.

Some countries have wage statistics available for generalist home-helpers or housekeepers. This was the case in Finland. In the Finnish version of International Standard Classification of Occupations based on ISCO-88 municipal housekeepers/home-helpers came under category 51331. However, data on the wages for housekeepers/municipal home-helpers are not always available because of problems related to the compilation of statistics on these occupations.

The International Standard Classification of Occupations (ISCO-08), which is in use in most countries, can be useful in defining the wages of housekeepers. The work of generalists may be included in categories 3221, 5152 and 5322. Many housekeepers are employed by private households and this affects the quality of the information available. Some of the work may also be done as "black market activities", which means that data on wages are not available.

Results from many studies indicate that generalist's and specialist's wages produce estimates that are fairly close to each other. It may be best that the method of valuation be decided at the country level: either to use generalist's or specialist's wages, or even black market fees. The essential aspect is that the method represents the best wages each country can find to remunerate unpaid household work. We do not prefer the use of the opportunity cost method.

#### ***4.2 Gross or net wages / normal or effective work time***

There has been much debate in international literature on the choice of the most appropriate *wage concept* that would be compatible with national accounting principles (see e.g. Blades 1997, Varjonen et al. 1999). Should we use net wages or gross wages, or perhaps gross wages with

employer contributions? Researchers remain divided on this issue, and calculations have been done using both gross and net wages.

Two basic assumptions lie behind the choice. On the one hand, if households were to buy the service from the market they would have to pay the gross wage. On the other hand, if it is thought that households earn the money by producing the services themselves, then the net wage would obviously be more appropriate because the households would not have to pay taxes or social security contributions for themselves. (Eurostat 2003, 27) Net wages without taxes and social security contributions would be also more relevant if the household satellite accounts are integrated into the core national accounts - or compared to them. Recording these kinds of imputed taxes and social contributions would mean that other sectors of accounts would have to show those taxes and social contributions as their revenues. However, the government sector does not normally record imputed taxes, and when no social security benefits are paid according to unpaid household production, there could not be any imputed social contributions for that work. Net wages have been used in multinational comparisons calculated by the OECD (2010) and Germany (Schäfer 1994, Rürger & Varjonen 2008).

*Working time concept:* Paid working time is usually used as the basis for hourly wages. Paid working time includes holidays, sick leaves, and daily coffee breaks. Data from time use surveys include only actual working time without times for meals and without sick leave, not to mention holidays. Therefore, the hourly wage used to value the time should include breaks, paid holidays and paid sick leaves that are generally remunerated by the employer.

## **5 Application of Eurostat model: Finnish household satellite accounts**

### ***5.1 The method***

In the compilation of Finnish household production, the methodology is based on the framework of national accounts consisting of the whole sequence of non-financial accounts with all transactions from output up to net lending. In the methodology, the total value of service output is targeted rather than only the value of the labour input used in the work. In the estimation of the value, the input method was applied. The analysis and description of household production followed the

principal functions approach. This means, in practice, that accounts were produced for all these functions separately.

Accounting rules for production account:

Value of labour  
 + other taxes on production  
 – other subsidies on production  
 = net value added  
 + consumption of fixed capital  
 = gross value added  
 + intermediate consumption  
 = value of total output (sum of costs).

*Value of labour* is estimated based on the time spent on unpaid work and a certain wage to assign value to the work time.

Value of unpaid work = hours of unpaid work per year per household \* hourly wage \* number of households.

Time use surveys, therefore, are an essential data source for the estimation of the value of labour. The time use information is gathered by household inclusive of the time spent on unpaid work by all its members aged over nine. For the valuation in Finland, we used the hourly wage of a generalist housekeeper/home helper from Statistics on local government wages and salaries. In Finland, the number of wage earners was a reasonable 11,505 for this tiny segment of 51331 (ISCO88). In these calculations, gross wages without employer's social contributions were used. *Taxes on production* include the annual vehicle tax and real estate tax households pay. *Subsidies* such as the child homecare allowance and family nursing support are paid to households that care for infants and small children at home. These subsidies are paid “as a consequence of engaging in production” (European System of Accounts, ESA 1995, 4.36). The subsidies were deducted for calculating the net value added. Data on taxes and subsidies were drawn from the Financial Statement of Central Government and the registers of the Social Insurance Institution.

For the purposes of the satellite account the *consumption* of goods and services, defined as household final consumption expenditure in national accounts, were divided into three groups: 1) those used direct for final consumption; 2) those used as intermediate consumption goods in household production; and 3) those used as capital goods in household production (durable and

semi-durable goods) and recorded in gross fixed capital formation of household production. The principles of the product classification are set out in Appendix 1. The consumption figures were drawn from national accounts but they were adapted to a more detailed level of classification by utilising the Household Budget Survey data.

*Capital goods* were defined as goods whose service life is longer than three years.<sup>2</sup> These consisted of all household durables as well as some semi-durable goods such as household textiles, kitchen appliances and cutlery, baby carriages and car seats. The estimates of service life are based on expert opinions (e.g. Work Efficiency Institute TTS, home appliance repair shops), estimates published in Eurostat methods report (Varjonen et al. 1999) as well as on figures used in the German and UK satellite accounts. The service life of cars is the average scrap age according to the 2006 statistics of the Finnish Central Organisation for Motor Trades and Repairs. (see Appendix 2) The yearly consumption was estimated using the perpetual inventory method (PIM), which was applied to the time series on durables in household final consumption expenditure.

Examples of intermediate consumption goods and services used in household production can be found in Appendix 1. Own-account dwelling services were the most problematic: should some of them be recorded as intermediate consumption of other principal functions or not? In principle, they should be included in the hire of the room so that the output would be comparable with market output. In these calculations they are not, but are treated as final consumption expenditure of housing instead.

## **5.2 Results**

### **5.2.1 Value of services**

The gross value added of household production in Finland totalled EUR 75 billion in 2006. Of this, national accounts recognised 9.4 billion, mainly derived from the production of imputed housing services by owner-occupied dwellings. The remaining EUR 65.6 billion was excluded from national accounts. This sum would have increased GDP by 39 per cent. Recognising the value of self-produced services would have increased household consumption by 55 per cent.

From 2001 to 2006, the gross value added of household production at market prices increased by 19 per cent and the total value of services grew by 25 per cent, indicating an increase in the material

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<sup>2</sup> One-year rule of SNA was not possible in practice.

intensity of household production. For instance, the share of the time and travel costs related to shopping has further increased. Shopping is a vital part of household production.

Output was organised by principal function: providing housing, meals and snacks, clothing, care and volunteer work. Providing housing is the largest of the household principal functions. It makes up one-third of the non-SNA household production. Providing meals is nearly as large as housing services and the others together make up one-third of the value. The proportion of consumption of fixed capital is very small except in housing.

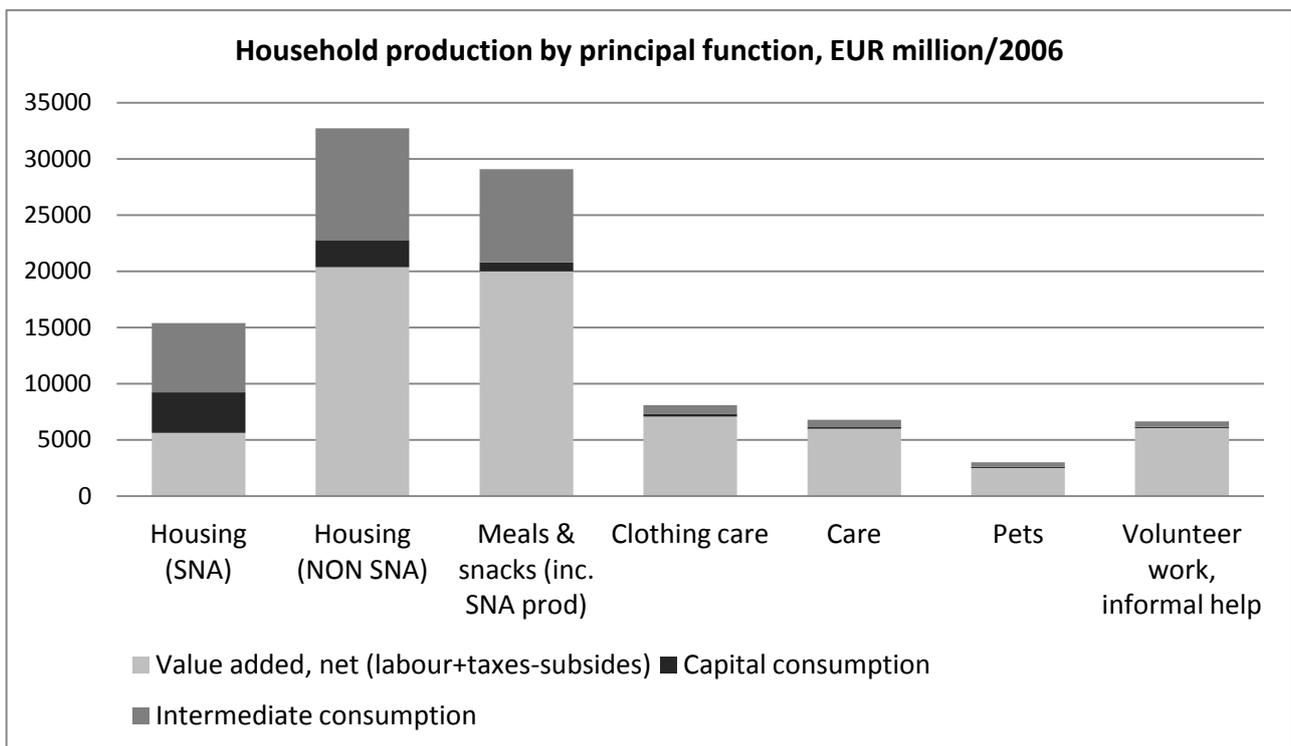


Figure 1 Value of services by principal function, 2006

One may be surprised at why the value of care services is fairly small. One explanation is that only primary time for care was taken into account. Keeping an eye on children while doing something else at the same time was not included. Preparing meals for children or washing children's clothing were allocated to the meals and clothing care functions. Helping elderly parents who live in their own household was allocated to volunteer work. Furthermore, large part of the childcare was outsourced. Some 82 per cent of women aged 35 to 54 in Finland were employed in 2006 and children were at public day-care that is available to all children under the school age.

The value of household production varies between families in different stages of life. It increases with age and the number of household members. Economies of scale occur in production. A family

of four does not prepare four meals separately but one meal for all of them in the same production process. However, this is not enough to cover all additional work in larger families as indicated in Figure 2. The value of household production seems to increase after retirement. A similar result was found in a German study (Lührmann 2007, 17). Retired Germans reduced household expenditure and substituted it by home production. This was most obvious in cooking and gardening.

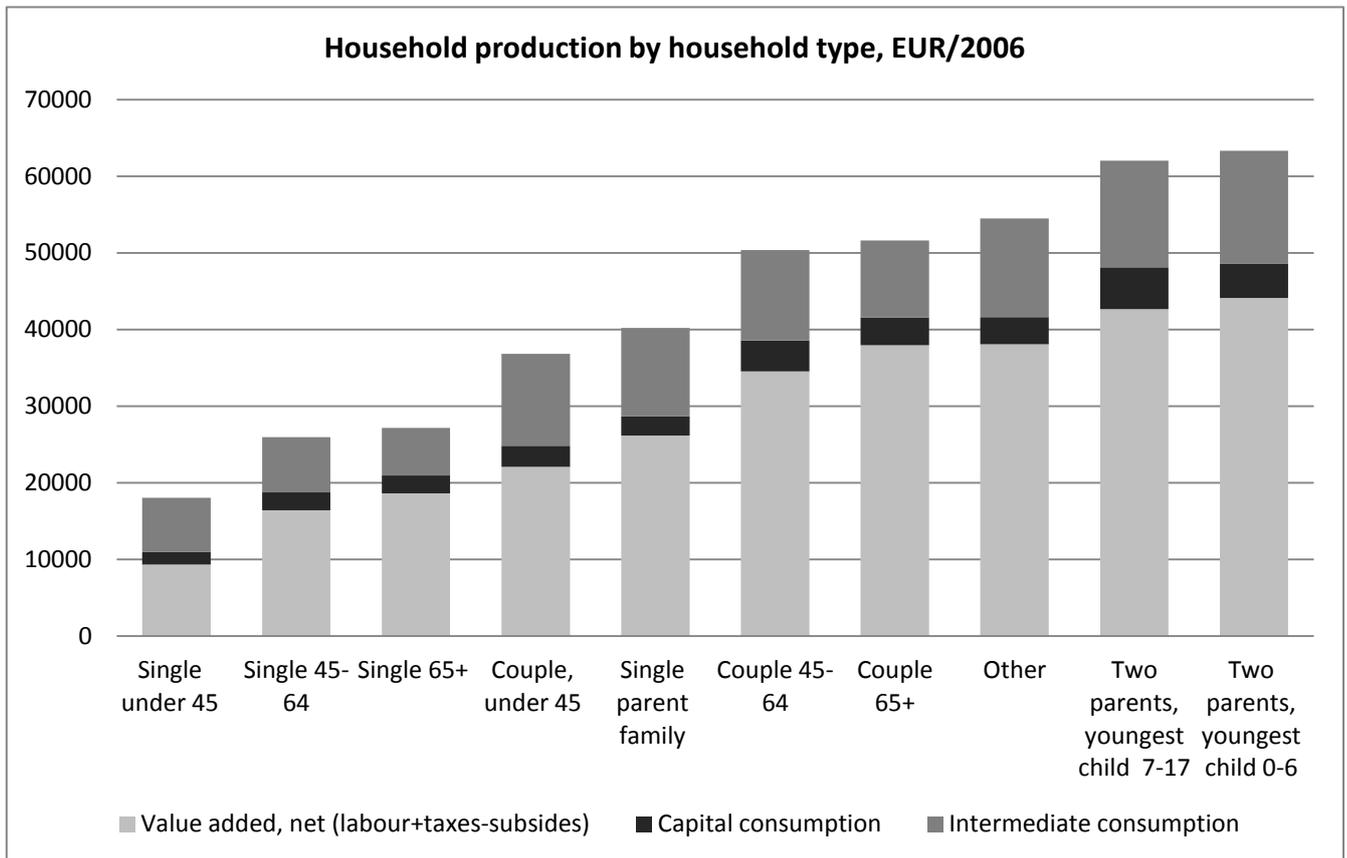


Figure 2. Value of household production by household type

### 5.2.2 Extended accounts

The financial significance of household production to the households themselves can be demonstrated by calculating their extended individual consumption, extended disposable income, saving and investment.

Table 2. Main aggregates of extended household accounts compared to SNA-based household accounts, 2006 (EUR million)

	SNA household accounts	Extended household accounts
Output	28 913	115 000
Intermediate consumption	12 055	32 527
Gross value added	16 858	82 473

Disposable income	80 645	142 492
Saving	- 1 450	- 465
Final consumption expenditure	82 160	143 021
Actual individual consumption	109 922	170 783
Gross fixed capital formation	10 061	14 815
Net lending	- 5 515	- 5 515

Household sector output grows almost fourfold. Extended disposable income grows by 77 per cent, mainly because of the value of labour. Of course, it can be used only for final consumption, which increases by 74 per cent (compared to final consumption expenditure) or by 55 per cent (compared to actual individual consumption, where also individual non-market goods and services are included). Saving improves because of reclassification of current transfers. Durables and semi-durables used as investments of household production increase gross fixed capital formation by 47 per cent. Final consumption expenditure and actual individual consumption do not increase by the same amount as the output of household production because some of the consumption expenditure has been reclassified as intermediate consumption and gross fixed capital formation of household production. Net lending should be the same in both versions because adding imputed transactions must have no impact on the financial situation.

The whole sequence of extended household accounts can be found as an Appendix 3.

## 6 Examples of uses of household satellite accounts

Satellite accounts can increase our understanding of the economic interaction between markets and households. The value and amount of home produced services can be compared to similar market produced services or services produced by public services. One example is shown in Table 4. Home produced meals can be replaced by ready-made meals from supermarkets or by eating out, and childcare services are replaced by public day-care services. We made calculations for meals and care services in Finland. Table 3 presents household expenditure on eating out and ready-made meals and food, and the value of home production of meals and snacks. The time spent on grocery shopping and respective travel costs are included in the own production of meals. Again, it is proven that households behave differently: young single people and couples rely on markets more

than the seniors do. This may be useful information for food marketers as the earlier research indicates that people tend to keep the food habits they adopt as young adults.

Table 3. Own production vs. use of market products in the case of meals and snacks by household type, EUR/household in 2006.

	Own production - meals and snacks	Eating out, snacks and ready-to-eat foods from the markets	Market food/ own production
Couple, 65 and over	17 195	1 670	0,10
Person living alone, 65+ yrs	9 268	1 014	0,11
Couple, 45-64 yrs	15 484	2 878	0,19
Person living alone, 45-64 yrs	7 859	1 691	0,22
Single-parent family	11 050	2 688	0,24
Two parents, youngest child 0-6	15 387	4 574	0,30
Two parents, youngest child 7-17	17 875	5 317	0,30
Couple, under 45 yrs	10 185	4 087	0,40
Person living alone, under 45 yrs	4 591	2 362	0,51

It should be noted that the column “Eating out...” includes value added tax and other taxes on products, but the column “Meals and snacks” does not, because the input method is used.

Another use of the data the satellite accounts provide is related to the provision of care services at the national level. Government allocates a good deal of resources both to public day care and to the care at home. Households still provided care that had circa twice the value compared to the public care in 2006.

Table 4. Production of care by household sector, market sector and public sector 2006

EUR million/ 2006	Own production	Market services	Government services (incl. support for informal care and allowances)	
			Households’ payments	Government and municipalities
Care for children	6 772	109	252	1 749
Care for adults		64	75	414
Institutional care of the elderly			145	713

Sources: Household satellite accounts 2006, Household Budget Survey/NA 2006, Statistical Yearbook of Finland 2006.

## 7 Conclusions

It is not possible to create a perfect method for household satellite accounts, since there are issues that can be addressed in different ways, none of them being the only right way. However - just as has been done with the core system of national accounts - it is possible to agree about the choice between different solutions and end up with a harmonised method producing comparable figures. Once there is a commonly agreed, harmonised method, it is always possible to reconsider the decisions and research the results obtained with different solutions, but it is not possible to develop a method further if there is no agreed method in the first place.

Eurostat proposal should be taken under scrutiny and developed into a strong recommendation for the input method. Eurostat / OECD should organise the work.

We suggest that the following should be discussed:

Whole sequence of accounts: increases possibilities to use the information in economic analyses and forecasts.

Definitions of outputs: adopting the principal function approach increases opportunities to make analyses of service industries.

Household production of different household types: improves forecasts for the demand of services in the public sector.

Value of labour: replacement cost, either generalist or specialist depending on the statistical possibilities in each country. Net wage concept but including breaks, holidays and other absences that are normally included in employment contracts.

## References

- Abraham, K.G. & Mackie C. (ed.) 2005, *Beyond the Market: Designing Nonmarket Accounts for the United States*. Washington DC. The National Academies Press.
- Blades, D. 1997, "A Proposal for the measurements of non-market household production", in *International association for time use research (IATUR)*. Stockholm.
- Duran, M.-A. 2007, *The Satellite account for unpaid work in the community of Madrid*. La Suma de Todos, Community de Madrid 36.
- European system of accounts: ESA 1995*. 1996, Office for Official Publications of the European Communities, Luxembourg.
- Final report of the sponsorship on measuring progress, well-being and sustainable development*, 11th meeting of the European statistical system committee ESSC 2011/11/05/en
- Goldschmidt-Clermont, L. 1982, *Unpaid work in the household: a review of economic evaluation methods*, ILO, Geneva.
- Harvey, A. & Mukhopadhyay, A. K. 1996, "The role of time use studies in measuring household outputs", in *The 24th General Conference of the International Association for Research on Income and Wealth*. Lillehammer, Norway. August 1996.
- Hawrylyshyn, O. 1977, "Towards a Definition of Non-Market Activities", *The Review of income and wealth*, vol. 23, no. 1, pp. 79-96.
- Holloway S., Short S. & Tamplin S. 2002, Household Satellite Account (experimental) methodology, Office for National Statistics. UK. Web.
- Household production and consumption. Proposal for a methodology of Household Satellite Accounts*. 2003, Task force report for Eurostat. Unit E1 edn, Eurostat, Luxembourg.
- Ironmonger, D., Soupourmas, F. 2009, "Estimating household production outputs with time use episode data", *eIJTUR*, 6(2)2009, 240-268.
- Jackson, C. 1996, "National Studies of the Value of unpaid work: a comparison of Methods", in *The 24th General Conference of the International Association for the Research in Income and Wealth*, Lillehammer, Norway.
- Kuwahara S. 2010, "A note on monetary valuation of unpaid work in Japan", *Working Party of National Accounts. STD/CSTAT/WPNA 2010/9*.
- Landefeld, J.S., Fraumeni, B.M. & Vojtech, C.M. 2009, "Accounting for household production: A prototype satellite account using the American time use survey", *Review of Income and Wealth*, vol. 55, no. 2, pp. 205-225.
- Lührmann, M. 2007, *Consumer expenditure and home production at retirement – new evidence from Germany*. Mannheim Research Institute for the Economics of Aging. 120-2007.

OECD. 2010, "Incorporating estimates of household production of non-market services into international comparisons of material well-being." *Working Party of National Accounts. STD/CSTAT/WPNA* (2010) 9. Web. 20 Mar. 2012.

Ruger, Y. & Varjonen, J. 2008, *Value of household production in Finland and Germany: analysis and recalculation of the household Satellite Account System in both countries*, National Consumer Research Centre, Helsinki.

Salamon, L., Sokolowski, M., Wojciech, S. & Haddock, M. A. 2011, "Measuring the economic value of volunteer work globally: concepts, estimates, and a roadmap to the future", *Annals of Public and cooperative Economics* 82(3) 2011, 217-252.

Schäfer, D. 2004, *Unbezahlte Arbeit und Bruttoinlandsproduct 1992 und 2001. Neuberechnung des Haushalts-Satellitensystems*, Statistisches Bundesamt.

*System of National Accounts 1993*, Commissions of the European Communities-Eurostat, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations, World Bank, Brussels/Luxembourg, New York, Paris, Washington, D.C.

*System of National Accounts 2008*, Commissions of the European Communities-Eurostat, International Monetary Fund, Organization for Economic Co-operation and Development, United Nations, World Bank, Brussels/Luxembourg, New York, Paris, Washington, D.C.

Szép, K. 2003, "Összefoglalás helyett – A Nemzeti Számlákban nem Kimutatott Háztartási Termelés Termelési Számlája és a Jövöbeli Feladatok", In *A Háztartási Termelés Értéke a Mai Magyarországon*. (Household Satellite Accounts, Statistical Sampling and Methodology Section. Hungarian Central Statistical Office.)

*Canberra Group Handbook on Household Income Statistics*. Second Edition. 2011, United Nations Economic commission for Europe.

Varjonen, J., Niemi, I., Hamunen, E., Sandström, T. & Pääkkönen, H. 1999, *Proposal for a Satellite Account of Household Production*, Eurostat Working Papers; 9/1999/A4/11. Web.

Varjonen, J. & Aalto, K., 2005, *Household Production and Consumption in Finland 2001: Household Satellite Account*. Statistics Finland and National Consumer Research Centre. Web.

Varjonen, J. & Aalto, K. 2010, *Kotitalouksien palkaton tuotanto ja ostopalvelujen käyttö. (Households' unpaid production and use of market services)*. National Consumer Research Centre. Publications 2/2010. (Abstract in English) Web.

## Appendix 1: Principles of the product classification

### Principles for the classification of consumption into intermediate consumption, capital goods and final consumption products

#### *Final consumption products:*

- All goods that are not related to household production (leisure, personal consumption).
- In the category of food, final consumption products were defined as consisting of food that is consumed as a snack or meal without cooking or heating (e.g. crisps, ready-to-eat meals). However, ready-to-eat meals that are heated at home were classified as final consumption products (prepared pizzas, casseroles, microwave meals). Fruit were classified as final consumption goods even though they have to be washed and often peeled before consumption. An exception was made with apples, which were classified as intermediate consumption goods. They were to represent all fruit used as ingredients in meal preparation and baking.
- Services that are purchased as a substitute to household production were classified as final consumption products (child day care, meal services, laundry services, shoe repairs), but if the service constituted only part of household production, it was defined as an intermediate consumption service (babysitting at the child's home).

#### *Intermediate consumption goods and services:*

- Intermediate consumption goods and services were defined as consisting of those foods that do not in themselves constitute a snack or meal (cold cuts, condiments) or
- that require further processing other than just heating and possibly assembling a portion on a plate.
- Repairs of appliances and machines used in household production were classified as intermediate consumption services.
- Household textiles are intermediate consumption goods because they are used as accessories for housing services.

**Durable goods** (D) and **semi-durable goods** (SD) are capital goods. For example, large household appliances are durable goods and small household appliances, cooking pans and other similar durable products were reclassified as semi-durable goods. These categories include those products and appliances that are needed in household production. (NB. This classification differs from the recommendations of Eurostat HHSA task force, according to which only COICOP-Durables are defined as capital goods).

For some expenditure categories (e.g. communications, transport), a percentage share is allocated to the various functions of household production in proportion to time use. For health care expenditure, only spectacles and contact lenses are included, using the same percentage as the time used for household labour as a proportion of waking hours.

## Appendix 2: Household capital goods

### Household capital goods, estimates of service life and proportion allocated to household production

	Service life, years	Percentage
C05111D Furniture	15	100
C05112D Garden and other outdoor furniture	10	100
C05113D Lamps and shades	10	100
C05114D Art objects	10	100
C05115D Decorations, mirrors	10	100
C05120D Carpets and other floor coverings	12	100
C05311D Ovens, stoves, sauna stoves	15	100
C05312D Refrigerators and freezers	13	100
C05313D Washing machines, dishwashers, tumble dryers	12	100
C05314D Sewing machines	20	100
C05315D Electric cookers, microwave ovens, vacuum cleaners	15	100
C05510D Garden appliances, other work appliances	10	100
C06131D Glasses, contact lenses, prostheses, hearing aids	5	21
C06132D Other therapeutic appliances and equipment	5	21
C07110D Motor cars	18	30
C07120D Motorcycles and snowmobiles	10	0
C07130D Bicycles	10	30
C08120D Telecommunication equipment	5	20
C09111D Radios, sound reproduction equipment, etc.	10	100
C09112D Televisions and video recorders	10	100
C09130D Personal computers, calculators and typewriters	5	20
C05211SD Textiles	10	100
C05212SD Mattresses	10	100
C05320SD Small electric household appliances	7	100
C05411SD Dishes, cooking dishes, etc.	15	100
C05412SD Table cutlery and cooking utensils	15	100
C05413SD Other household articles	15	100
C05521SD Household utensils and tools	10	100
C05522SD Small electric accessories	10	100
C09320SD Fishing and hunting equipment	7	100
C09342SD Pets and pet supplies	8	100
C12222SD Baby carriages, car seats, back and front carriers, etc.	3	100



