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Value of domestic work and household satellite account in Hungary

Contents

Introduction

Households carry out a lot of housework daily, which is important for members of households. This work is unpaid and is consumed within households, so it remains invisible for economic statistics, presenting the economic performance of a country. Domestic work partly completes (e.g. hemming of purchased trousers), partly even substitutes (e.g. cooking at home – meals at restaurants) market work and financial income. Contributors to the living standards of households are purchased goods and services as well as domestic work, so only the inclusion of these two together can provide a real picture. When analysing the economic performance of the country, the picture can be distorted when making comparisons over time and across countries if the differences in the proportion of domestic work are left out of consideration. The household satellite account is an accounting framework that allows for the valuation of unpaid work (carried out for own and other households, furthermore, voluntary work) based on uniform principles and the accounting of household production in line with national accounts.

The size of household production is considerable in Hungary:

- Based on the 2009–2010 time use survey, the population living in private households and aged between 15 and 84 years spent more time (214 minutes daily) on unpaid work on average than on productive work (164 minutes daily) that is included in national accounts. This is not surprising if one takes into account that almost all members of the population (90.6%) participated in housework, compared with only a third (32.2%) in paid work.
- If unpaid working time is valued with the net wages of a qualified market substitute suited to the character of the work, the inclusion of the performance of unpaid work would increase the income of households by 37%. The inclusion of services produced with unpaid work would mean a 38% higher value in the consumption of households.
- This is considerable in the performance of the national economy, too. 'Extended' production, which is calculated taking into account the performance of unpaid work[1], resulted in a 25% higher GDP value in 2010. In international comparisons these are not outlying values.

The volume of domestic work is presented with time use data, while its money value at the aid of the household satellite account. We act in line with Eurostat recommendations and internationally adopted methodological principles in both cases. Further on the concept of the household satellite account is shown first.

[1] Along with its input-based accounting based on net wages.

Household satellite account

The system of national accounts is a comprehensive and consistent system of macro-economic accounts for countries with a market economy. The system of national accounts provides a comprehensive picture about the economic situation of the country and about production, the generation and distribution of incomes, furthermore, expenditure and consumption. The European system of national accounts (ESA 2010) is a system of accounts based on the UN principles of national accounts – adapted in accordance with European needs and characteristics –, and its application is compulsory for member states. HCSO compiles and publishes the quarterly and annual, preliminary and final estimates of national accounts for Hungary.

In compliance with its theoretical background the system of national accounts defines the general concept of economic production, which covers household production as well, but uses a narrower, operative concept when compiling the accounts. The emphasis is on the market emergence of transactions, when the user is an institutional unit separate from the producer. Thus out of household production (and voluntary work) it takes into account only goods producing activities which are significant also in national economic terms, such as own-account construction of dwellings and agricultural production for own consumption. To produce data comparable at international level, the system of national accounts also includes imputed rent, estimated as the production and consumption of owner occupiers of dwellings. The ESA distinguishes institutional sectors: the sectors of non-financial corporations, financial corporations, general government, households and non-profit institutions serving households. Household production is linked primarily to the household sector.

The household satellite account fits to the core system of national accounts in terms of its concepts and structure, at the same time, it satisfies special needs as well with the full-scale accounting of household production for own use and with the total accounting of the unpaid performance of households as mini plants.

Gross value added and incomes generated are deduced from the value of produced products and services in the production and in the income accounts. In the case of household production the value is estimated as the sum of all input components, and to compile the accounts the following items are to be estimated:

Figure 1

Scheme of input-based estimation method

value of work
(time use x estimated wages per unit of time)
+ other taxes on production
– other subsidies on production
+ consumption of fixed capital

= gross value added
+ intermediate consumption

= output

The different items are presented in the order shown in the scheme.

Time spent on domestic work

It is the 2009–2010 time use survey of HCSO (HCSO, 2012) that gives a picture about the time use of the population living in private households[2] in Hungary. The survey collects information on the activities of people in a representative sample of the population – recorded on days which represent the year as a whole, during 24 hours[3]. The collected data give information on the starting time and other circumstances of these activities: their place, the people participating and being present, parallel activities and the purpose of the particular activities.

To calculate the time spent on domestic work, household production is to be defined first. It is generally accepted that based on the "third party" principle what could be replaced by market products or services can be considered as household production. In this sense, e.g. studying, personal care for oneself, sleeping and leisure activities cannot be considered as production, since these cannot be delegated to someone else.

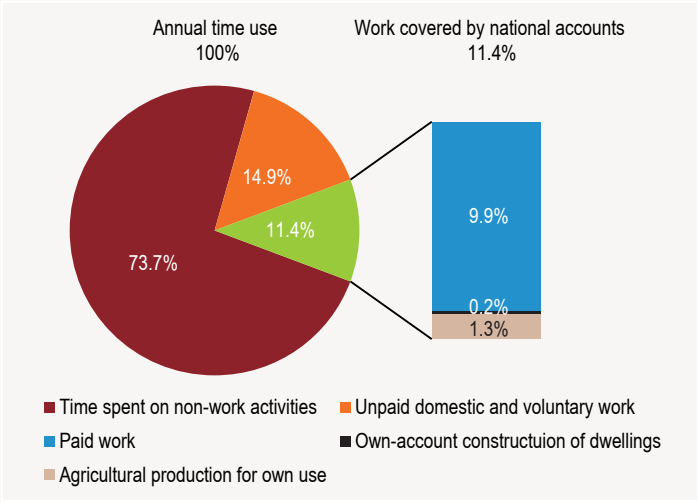
In line with this methodological consideration, the following three large groups of activities can be distinguished on the basis of daily activities in the time use survey:

I Unpaid domestic and voluntary work,
II Work accounted in national accounts,
III Non-work / non-productive activities[4].

The population aged 15–84 years living in private households in Hungary (8.25 million people) spent 26.3% of their total annual time on paid and unpaid work as a whole in 2009–2010 (Figure 2). Unpaid work accounted for nearly 15% and productive work covered by national accounts 11.4% of total time. 1.5 percentage points of this was represented by construction activities and small-scale agricultural production for own use, also performed in households, which make part of national accounts according to the present rules of the EU on national accounts (ESA).

Figure 2

Structure of time use of population aged 15–84 years, 2009–2010



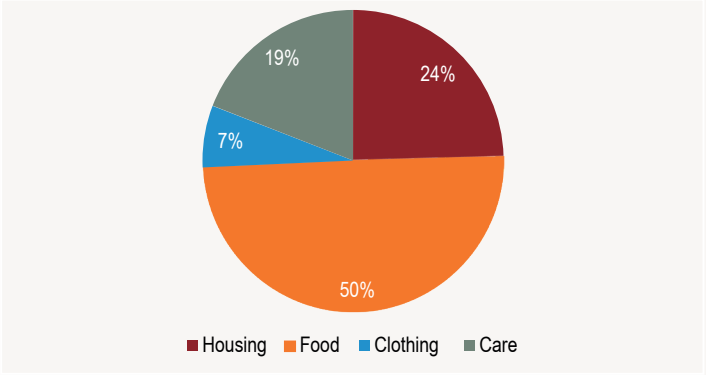
The household satellite account is compiled by recording activities classified into group I (a total 14.9%), household members performing the largest part of these (95.9%) for their own household and 3.9% for other households, at last voluntary work carried out through or for voluntary organisations is also recorded as unpaid work, which made up a further 0.2%.

In the conceptual framework of household production the principal functions of households are to provide housing, food, clothing and care for their members. The distribution of unpaid domestic working time can be analysed from this point of view as well (Figure 3).

Providing *food* (cooking, baking, roasting, frying, doing the washing up, preservation of food) accounted for the half of the working time spent on own household. The time required for cooking is not high at one time but as people regularly cook in almost all households (65% of people interviewed spent time on preparing food) it is outstanding as aggregated annually.

Figure 3

Distribution of working time spent on own household in population aged 15–84 years, by function, 2009–2010

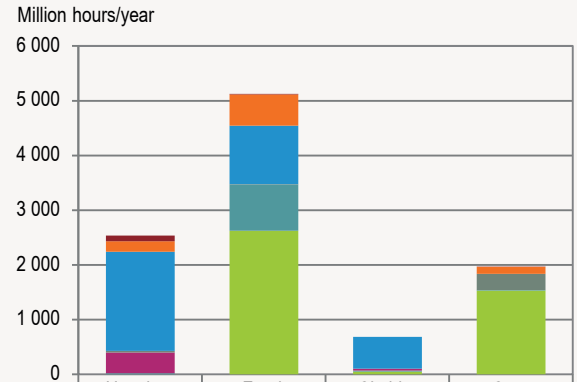


The second most time is required by *housing* (cleaning, repair of furniture, looking after ornamental plants), which accounted for nearly a quarter of domestic working time. *Care* represented nearly 20% of working time, it covers two significantly separate items, care for children and for adults in need. In own household it crucially (92%) means looking after children (playing, pedagogy, telling a tale, studying, physical hygiene care, accompanying children). The lowest proportion of time is spent on *clothing* out of the functions.

For all the four functions a distinction was made between basic activities (e.g. cooking, preparation of clothes) and ancillary activities serving the function (e.g. cleaning, buying, transportation). The above proportions can be further analysed at the aid of Figure 4, in which the annual working time input of the population is expressed in million hours.

Figure 4

Distribution of working time spent on own household in population aged 15–84 years, by function and character, 2009–2010



	Housing	Food	Clothing	Care
Management	104	9	0	5
Transportation	190	573	0	129
Keeping clean	1 814	1 065	581	0
Small-scale production	29	8	0	292
Maintenance	382	0	36	0
Buying	17	844	21	10
Basic activities	0	2 626	47	1 532

2 We assume that the volume of productive domestic work carried out in institutional households (children's homes, students' hostels, residential social institutions, hospitals) is negligible on a national scale. 2.4% of the resident population lived in institutional households at the time of the 2011 Population Census. The survey does not cover homeless people either, their number was 0.1% of the resident population according to the last population census.

3 A maximum of 44 activities can be recorded for one day, which were classified based on a code list containing over 500 elementary activities.

4 Including time spent on e.g. sleeping, eating, studying and entertainment.

The basic activity for *housing* is own-account construction of dwellings, but since it is part of national accounts, it is not included here. The time spent on cleaning (1,814 million hours) was by far higher than the working time for maintenance and heating related to the dwelling (382 million hours). In providing *food*, basic activities (cooking, baking, roasting, frying, preparation of food) took hardly more time (2,626 million hours) than the related ancillary activities such as buying, transporting bought things home and doing the washing up in total (2,499 million hours). The largest time input in connection with *clothing* was made up by washing and ironing (581 million hours). The domestic preparation of clothes and domestic sewing, knitting and crocheting are not typical any more (47 million hours). In *care*, the reason for the large weight of basic activities (1,532 million hours) can be that care is the least differentiated activity, ancillary activities are not separate from basic activities in practice.

Table 1 shows the annual volume and distribution of time spent on unpaid domestic and voluntary work by function and character of activity. So this is the time input that serves as ground for the calculation of the value of household production.

Table 1

Unpaid domestic working time and its distribution in population aged 15–84 years, 2009–2010*

Denomination	Work carried out for own and other households				Voluntary work	Total
	Housing	Food	Clothing	Care		
	Million hours/year					
Basic activities	**0**	**2 684**	**54**	**1 639**	**22**	**4 399**
Ancillary activities	**2 669**	**2 524**	**645**	**520**	**3**	**6 361**
Of which:						
Buying	17	850	22	11	0	900
Maintenance	428	0	37	0	0	465
Small-scale production	29	9	0	292	1	331
Keeping clean	1 880	1 082	586	0	1	3 549
Transportation	207	573	0	211	0	991
Management	109	9	0	5	2	125
Total	**2 669**	**5 208**	**699**	**2 158**	**25**	**10 760**
	Distribution, %					
Work carried out for own household	95.0	98.4	98.0	91.2	–	95.9
Work carried out for other households	5.0	1.6	2.0	8.8	–	3.9
Voluntary work	–	–	–	–	100.0	0.2
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

* Based on time use survey in 2009–2010 (N=8.25 million people). Data may not sum to the total due to rounding.

Characteristics of labour market wages

Wages must be assigned to domestic working time input, so that the value of household production can be estimated. The source of wages data is the 2010 individual wages and salaries survey[5] of the Employment and Social Office, which actually means two data collections depending on whether respondents are business units or public institutions. Respondents supply data on the organisation and on a sample of employed persons. This is the data source with the highest number of units, the most detailed one in this theme. From the survey different labour market incomes can be calculated, out of which monthly average hourly wages and their gross and net values were applied.

The wages imputation method can be based on the hourly wages of (1) a general substitute or (2) special substitutes or on (3) opportunity cost.

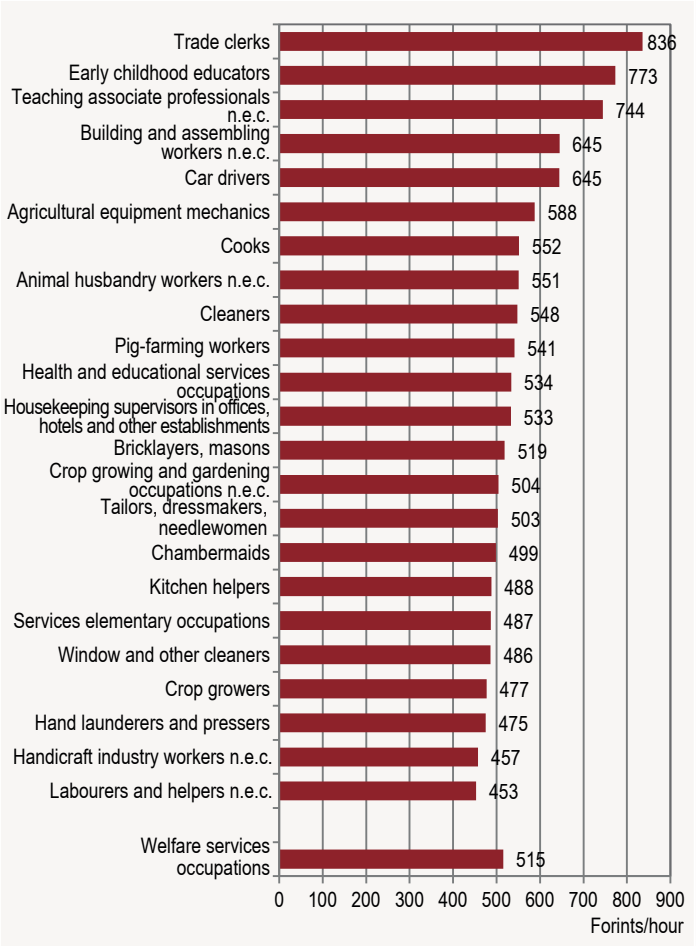
(1) In the case of the general substitute method we searched for the job with which almost all domestic work can be carried out, so we used the average hourly wages of welfare services occupations (5330 in the Hungarian Standard Classification of Occupations (FEOR)).[6]

(2) For the special substitutes method we chose the occupations (similar to the particular domestic activities) that seemed to be the most suitable for the particular activities: for example, the time spent on cooking was valued with the hourly wages of cooks, the time required for transportation by passenger cars with those of motor vehicle drivers and the time required for child care with those of early childhood educators.

Occupations chosen for estimations according to methods (1) and (2) and their monthly net hourly wages are shown in Figure 5.

Figure 5

Net hourly wages of general substitute and special substitutes based on individual wages and earnings survey in 2010



(3) In the case of the opportunity cost method, the time spent on domestic work is valued with the own hourly wages of people doing that, on the conceptual basis that they abandoned such hourly wages when they carried out domestic unpaid work instead of their paid work. The time use survey does not cover the wages of respondents but these can be estimated by imputing personal wages data from the individual wages and salaries survey. The basis of the estimation is a linear regression on data of the individual wages and salaries survey, which regression estimates the

5 Nemzeti Foglalkoztatási Szolgálat (National Employment Service): Egyéni bérek és keresetek statisztikája. [Statistics of individual wages and salaries.] http://nfsz.munka.hu/engine.aspx?page=full_AFSZ_Egyeni_berek_es_keresetek_statisztikaja

6 For the general substitute method, domestic helpers would be the most suitable occupation, however, no reliable data are available on their wages.

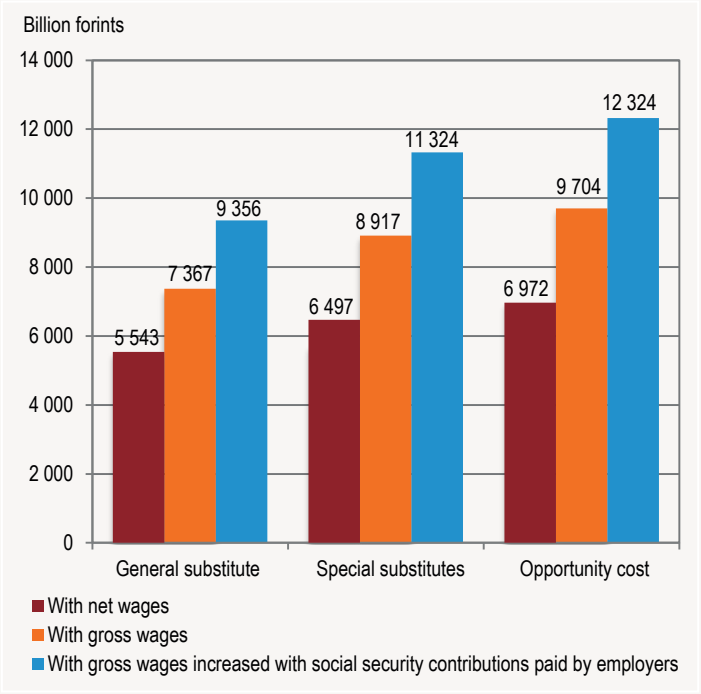
logarithm of hourly wages data based on socio-demographic variables (for example sex, age, educational attainment) and some other characteristics of the work carried out by employed persons (occupation, NACE division of workplace, number of employees at workplace). We estimated wages with this function, using such variables known for the different persons from the time use survey. Age and highest completed level of education had the highest positive effect in the regression of hourly wages. However, in the case of low educational attainment lower wages are typical at higher ages, which was shown by a parameter describing the interaction of low educational attainment and age.

Value of domestic working time

The value of domestic working time was calculated as the product[7] of the volume of time input expressed in hours and hourly wages used in calculations. In the case of all the three valuation methods (general substitute, special substitutes, opportunity cost) gross and net wages were considered as well as gross wages increased with social security contributions paid by employers (27% in 2010)[8], so 9 versions were prepared in total. Personal income tax progressive by tax brackets was in force in 2010, so there are smaller differences between the values calculated with net wages than in the case of gross wages. The value of unpaid work is very sensitive to whether gross or net wages are used in calculations, and the effect of the method is also significant, though to a lower extent.

Figure 6

Value of unpaid working time according to substitutes and opportunity cost methods based on three variants of taxes and contributions



The wages of special substitutes are generally higher due to their specific professional skills than those of a general substitute (Figure 6). This, however, highly depends on the occupation which is chosen as a general substitute. In case reliable data had been available on the wages of domestic helpers, this may have resulted in even slightly lower values.

Special substitutes correspond to the level of wages of skilled workers, this reflects the value of domestic work the most properly in the opinion of the researchers. Domestic work requires the special knowledge of local needs and environmental conditions in addition to the knowledge of special fields (washing, cooking), furthermore, it also includes certain unseparated management and organisational tasks. In the case of households as mini plants, special substitutes are good choices, since the decisions required here can be identified with the competence of medium-level leaders.

In the case of opportunity cost, the time spent on household production was multiplied by estimated hourly wages that a person doing domestic work would earn in her/his own paid job. This value basically depends on the potential earnings of the person doing domestic work and not on the character of the household work carried out. As not only people with low earnings but everybody in the society does domestic work, it is not surprising that this way of valuation results in the highest value. The wage level achieved on the labour market may not necessarily reflect the value of domestic work properly.

As for the inclusion of taxes and contributions, the application of net wages is realistic based on the opinion of the researchers, since no taxes are paid on unpaid work, which will not generate public revenue, and unpaid work implies neither pensions nor sick-pay. A further argument is that if households decide to employ substitutes, they usually do so not as registered employers, and so they do not satisfy their tax obligations either in connection with this. Wages thus paid are probably closer to net wages.

The population living in private households carried out 10,760 million hours of unpaid work not included in national accounts, for own household or other households or as voluntary work in 2009–2010. This amount of working time valued at the net hourly wages of the special substitutes corresponding to the different activities resulted in a value of 6,497 billion forints. How much does it mean in respect of households and how much for the total national economy? To judge the amount it is advisable to connect it to national accounts, which can be ensured by the household satellite account.

Estimation of other items in household satellite account

Other taxes and subsidies on production. Other taxes on production are incurred in relation to production, irrespective of its volume and value. Examples include taxes on the ownership of assets utilised in production, e.g. motor vehicle tax. The part of this to which extent the vehicle is used for household production is considered as a tax classified to household production (25% of the taxes paid by the household sector). Taxes on dwellings and land property are recorded in the appropriate place in national accounts, so here no correction is made with them. Similarly to taxes, those subsidies are to be taken into account here that households obtain to perform household production. Child care allowance and child raising support were classified here in 2010, since parents obtained them, under conditions that access to employment and the placement of children in community were restricted while they obtained them. Care provision allowance is also treated as other subsidy on production, which major persons undertaking the domestic care of relatives in need of long-term care obtain as a benefit. Family allowance and personal income tax allowances are not classified here because personal involvement in household production is not a condition thereof.

Intermediate consumption. National accounts treat households as units of consumption primarily, and record the goods and services bought by them as actual final consumption. Of the final consumption expenditure of resident households we need to separate the amount that is not final consumption expenditure but intermediate consumption for production in households (e.g. detergents or unprocessed raw materials for food preparation, total estimated value: 1,924 billion forints) and fixed capital formation (durable goods serving household production: e.g. washing machines, total estimated value: 386 billion forints) from the point of view of the satellite account. Due to the level of detail of data on final consumption expenditure and to the lack of accurate knowledge of the time required for its use, we applied only rough estimations, e.g. 50% of expenditure on fruits and vegetables as well as meat was considered as

7 In the general substitute method, the total time of work carried out in all households was multiplied by the same hourly wages, while in the special substitutes method for each work by the corresponding hourly wages. In the opportunity cost method, the total annual unpaid working time of the different people were multiplied by the estimated hourly wages of the particular people.

8 This is referred to in national accounts as compensation of employees.

intermediate consumption, and the other 50% was supposed to be consumed fresh, without processing, or to be bought in processed form. Another example: merely 20% of postal expenditure was consumption for household production (for e.g. administration), 80% was accounted as recreation activities.

Consumption of fixed capital. For the input-based estimation of the output of household production, the amortisation of the stock of fixed assets (consumption of fixed capital) used in household production has to be known. The stock of assets available in households (e.g. vacuum cleaners, kitchen utensils, washing machines) is used and gradually wears out in production. The consumption of fixed capital reflects the loss of value in the value of assets – due to use, wear and tear as well as accidental damage. No direct information is available on this. Therefore, model calculations need to be made using the available data. The value of the stock and of the consumption of fixed capital (total estimated value: 420 billion forints) can be calculated with the perpetual inventory method (PIM model), used for the estimation of the value of assets. For the model-based calculations we needed the value, the age and the life expectancy of the gross fixed capital stock. Data on durable consumer goods came from the household budget survey on the one hand and were separated from the accumulated values of final consumption expenditure, recorded in national accounts, on the other hand. As assets are of different age, appropriate price indices were needed, too, to estimate their present gross value from their purchase price.

Capital formation. The purchase of assets used for household production is considered as capital formation. The amount spent on buying fixed assets (386 billion forints) was separated from the final consumption expenditure of households, similarly to the items of intermediate consumption. This group of assets is implicitly the same as that for which the consumption of fixed capital was calculated.

Table 2

Production account of household production not accounted in national accounts, 2010

(billion forints)

Denomination	Housing	Food	Clothing	Care	Voluntary work	Total
Value of work[a)]	1 525	3 099	341	1 518	14	6 497
Other taxes (+) and subsidies (–) on production	12	2		–96		–81
Net value added	**1 538**	**3 101**	**341**	**1 423**	**14**	**6 416**
Consumption of fixed capital	175	168	31	46	0	420
Gross value added	**1 713**	**3 269**	**372**	**1 468**	**14**	**6 836**
Intermediate consumption	369	1196	123	235	0	1 924
Output	**2 082**	**4 465**	**495**	**1 704**	**14**	**8 759**
Capital formation	158	164	25	38	0	386

[a)] Calculated with net wages of special substitutes.

Out of the five main functions food required 62.2% of total intermediate consumption and nearly 43% of total gross fixed capital formation. Nearly 19.2% of total intermediate consumption and 41% of total gross fixed capital formation was allocated to housing. These proportions are also influenced by the fact that only a part of the purchases of fixed assets related to the dwelling serve production, while all fixed assets in connection with food were considered as productive. Expenditure spent on care was the item ranked third and expenditure on clothing was the fourth. By voluntary work we mean unpaid work carried out through an organisation. It is assumed that household members used neither their own fixed assets nor their own materials in these activities of theirs.

Household production not included in national accounts is services in nature. This is reflected by its labour-intensive nature, i.e. 74% of the estimated value of its output comes from the value of labour input.

We note here that although the household satellite account – by definition – covers all production of households for their own use (including unpaid production for other households and as voluntary work, too), Table 2 covers only the part of household production not included in national accounts. It is not completed with the items already included in national accounts (own-account construction of dwellings, agricultural production for own consumption, imputed rent). This means that this account is not suitable to present the total of household production but is suitable to illustrate the effect the integration of the items of household production not included in national accounts would have on the system.

Integration of household satellite account into core national accounts, i.e. extended national accounts

The basic idea of the household satellite account is to valuate household production in money terms, also allowing for its economic analysis so that the account for household production can be integrated into core national accounts. In line with international practice the accounts containing the whole of household production are called "extended" accounts, referring to using the extended concept of production.

Household production is related primarily to the household sector account of national accounts.

Table 3

Main indicators of extended household sector account, 2010

Denomination	Output	Gross value added	Net[a)] adjusted disposable income	Actual final individual consumption
	Billion forints			
Production of household sector in national accounts	5 772	3 913	17 242	17 138
Household production not included in national accounts[b)]	8 759	6 836	6 416	6 450
Extended household sector account	14 532	10 748	23 658	23 588
	Distribution, %			
Production of household sector in national accounts	100	100	100	100
Household production not included in national accounts[b)]	152	175	37	38
Extended household sector account	252	275	137	138

[a)] Concept used in national accounts: net value since it excludes consumption of fixed capital.
[b)] Calculated with net wages of special substitutes.

In the system of national accounts the production activities of households have small weight (14.5% of GDP), but due to their employee function they are substantial income owners and have an outstanding role in consumption. Actual final individual consumption as a proportion of GDP was 63.4%. If household production for own purposes is fully included at the aid of the satellite account, i.e. is added to the output already recorded in national accounts, the picture will be modified significantly. With the inclusion of services produced in households, the output of the household sector

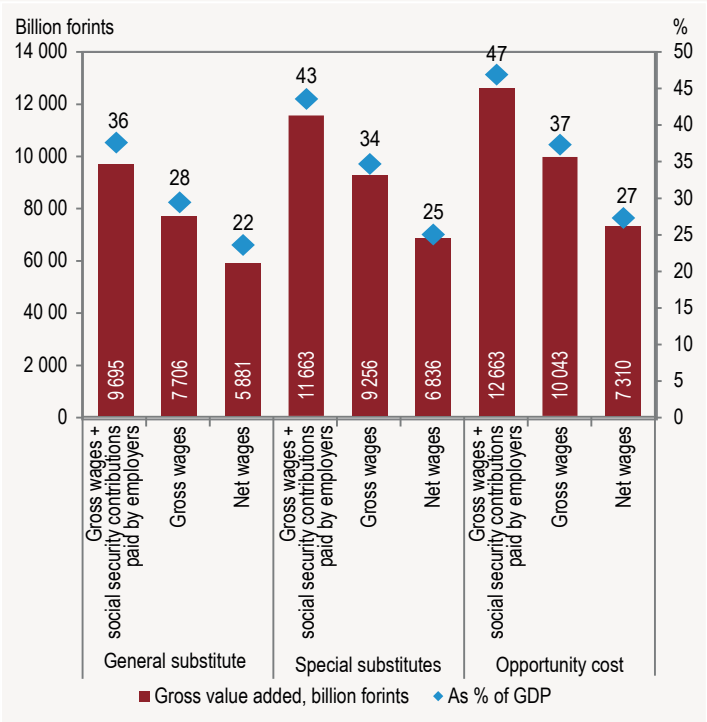
increases 2.5 times higher and the gross value added produced in the sector to an even higher extent, over 2.7 times higher. The net adjusted disposable income of households includes not only the cash income of households but also social transfers in kind such as educational and health services received from the government and e.g. sports and religious services received from the non-profit sector serving households. The adjusted disposable income of households will be 37% larger when increased with the virtual income accounted from household production. This is not an income they would receive in cash but an imputed income which is the labour value of the services they produced for themselves. If households had wanted to buy these services, they would have had to spend as much more, they would have needed such an additional income to maintain this consumption level without household production. The extended consumption of households was calculated by subtracting the intermediate consumption and durable assets purchases of household production from and adding the total output of household production to the household consumption recorded in national accounts.

All in all, the weight of households in national accounts is modified significantly by accounting for all household production. The output of households rises several times higher and the income and the consumption of this sector grow significantly as well, both by about a third. The question is the volume of household production in the total national economy.

To judge the magnitude of household production in the national economy, it is interesting to compare it to GDP, amounting to 27,052 billion forints in 2010 (HCSO, 2015). The gross value added calculated – with the net wages of special substitutes, as deemed suitable by us – for the part of household production not accounted in national accounts was 6,836 billion forints, which means that GDP would be 25% higher if household production was fully included, too. Considering that the largest weight in the gross value added produced in household production is represented by the value of working time, it is not surprising that depending on the different methods of estimation of the value of working time the results are significantly differing. The higher the wages are, the larger the virtual contribution of household production is. The inclusion of household production would complete the value of GDP by 22%–47% depending on the chosen method of valuation (Figure 7).

Figure 7

Gross value added – calculated by different methods – of household production not covered by national accounts and its ratio to GDP



The household satellite account was compiled based on Eurostat recommendations, in compliance with the principles therein – for the year 2000 earlier on and for 2010 currently.

The changes over the 10 years were complex. Time spent on own-account construction of dwellings and on agricultural production for own consumption, i.e. the part of household production included in national accounts, has decreased to less than the half since 2000. By contrast, time spent on household production not covered by national accounts was up by 10%. It was not homogeneous. Time spent on care rose the most rapidly (by 40%), the proportion of care growing from 15% in 2000 to 19% by 2010. On the contrary, time spent on clothing was down to 70%, so its share shrank as well, from 10% to 7%. The share of housing and food did not change significantly. Based on comparable figures the estimated value of household production went up at a higher rate than GDP, as a consequence, the 10% growth of labour input implied that the inclusion of household production not covered by national accounts would have increased GDP at an 8 percentage-point higher rate in 2010 than in 2000.

To sum it up, the unpaid work carried out in households, although it remains invisible from the point of view of economic statistics and national accounts, represents a nationally significant productive value for households and also for the whole national economy.

A detailed publication presenting the household satellite account will be issued later on.

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