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WHAT IS HOUSEHOLDS' NON-MARKET PRODUCTION WORTH?

Ann Chadeau

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Ann Chadeau is an administrator in the Economic Statistics and National Accounts Division of the OECD Economics and Statistics Department. She wishes to thank Derek Blades, Jeffrey **R.** Shafer, Peter Sturm and Bernard Wacquez for their many useful suggestions and comments. She is also grateful to Michèle Hainaut and Micheline Harary for their help.

INTRODUCTION

This paper deals with the measurement of "non-market production" by households. Non-market production covers the goods and services household members produce for their own consumption by combining their unpaid labour and the goods and services they acquire on the market. The value added generated by these activities is excluded from conventional macro-economic aggregates. The national accounts seem to be saying that household production is worth nothing, but housework both increases the value of purchased goods and services and contributes to the formation and upkeep of human capital. Its value is clearly substantial.

Economists have argued for many years that ignoring the income and wealth generated by housework introduces a bias in various areas of economic analysis. Mitchell *et al.* (1921), Kuznets (1944), and Clark (1958) have pointed out that national income is significantly underestimated by not taking into account income in kind provided by productive household activities. Kende (1975) argued that, as conventionally measured, final consumption gives a misleading picture of "real" consumption when the goods and services produced by unpaid labour of household members are excluded. Weinrobe (1974) noted that measured growth rates are biased upwards as more and more women move into the labour market. Only the ensuing changes in market production are taken into account and no allowance is made for the resulting decline in non-market household production. Nordhaus and Tobin (1972) contended that the production of non-market services by household members contributes to economic welfare which, as a result, is not properly measured by conventional GNP. Walker and Gauger (1973) argued that the economic contribution of women to production is grossly understated by conventional statistics because women perform about two thirds of all housework.

These considerations have prompted studies in several OECD countries in which authors develop measurement methods and provide monetary estimates of value added by productive activities of households outside the market. The first section of this paper discusses the treatment of non-market household production in the UN-OECD System of National Accounts (SNA); the second section discusses the various methods which have been used to impute money values to the output of household productive activities; the third section compares estimates of the value added by unpaid household activities in several OECD countries and shows their importance relative to "official" gross domestic product, household consumption and household disposable income.

I. THE DEFINITION OF PRODUCTION IN THE SYSTEM OF NATIONAL ACCOUNTS

In the 1968 version of the SNA (United Nations, 1968), primary products for own consumption (products from agriculture, mining, quarrying, etc.) and the goods processed from primary products (butter, wine, cloth, etc.) are included in gross output; also included are other commodities which households produce for sale on the market as well as for own consumption (e.g. the suits a professional tailor makes for his sons); fixed capital assets constructed for own use are also to be added to gross output. Services are not mentioned, except for the housing services which owner-occupiers of dwellings render to themselves.

In the revised SNA (Draft, November 1991), the production definition (which the SNA refers to as the "production boundary") now includes *a// **goods*** produced by households for their own consumption but it excludes all *services,* except for housing services produced by owner-occupiers of dwellings, and storage which is considered as an extension of the goods production process.

The revised SNA explains the exclusion of household services as follows:

> "The reluctance of national accountants to impute values for the outputs, incomes and expenditures associated with the production and consumption of domestic and personal services within households is explained by a combination of factors, namely the relative isolation and independence of these activities from markets, the extreme difficulty of making economically meaningful estimates of their values, and the adverse effects it would have on the usefulness of the accounts for policy purposes and the analysis of markets and market disequilibria – the analysis of inflation, unemployment and **so** on. It could also have unacceptable consequences for labour force and employment statistics. According to ILO guidelines, economically active persons are persons engaged in production included within the boundary of production of the System. If that boundary were to be extended to include the production of own-account household services, virtually the whole adult population would be economically active and unemployment eliminated."
>
> The Production Accounts (Draft, November 1991, p.9)

The arguments for excluding domestic and personal services from the production boundary in the System are not all equally convincing:

- Housing services produced by owner-occupiers of dwellings are not intrinsically different from other services produced for own consumption: they are included in the production boundary **so** as to avoid distorting estimates of the production and consumption of housing services when the ratio of owner-occupied to rented dwellings varies over time and space. The same kind of distortions may arise with other domestic and personal services produced for own consumption. For example, the substitution of hired cooks, restaurant meals or prepared foods in the place of home cooking involves a similar distortion.
- It is argued that imputed income does not have the same economic significance as monetary income: monetary income leaves the consumer free to choose among the goods or services available on the market, whereas imputed income from household production can only be used to purchase the output from that

production. However true this is, it is not specific to imputed income from non-market household production: the imputations made elsewhere in the **SNA** are also different from marketed output.

- Imputing a meaningful price to ***goods*** produced by households could turn out to be **as** difficult as for ***services,*** Pricing goods requires the existence of a market for them. If, for instance, households fetch their own water it is almost certainly because the market does not provide them with running water at home: finding an appropriate price for imputing a value to water will be difficult. On the other hand, a household member could decide to sell part of a meal she or he has prepared: in this case, a market price is readily available to impute a value to the meal consumed by the household.
- To measure the value of output, it is first necessary to collect statistics on production. Household surveys show that statistical data are no more difficult to collect for many services, such as meal preparation or laundering, than for goods.
- The revised **SNA** describes own account production of services as a "completely self-contained activity with limited repercussions on the rest of the economy". One could argue that there are many interactions between what is produced on the market and what is produced in the home (Chadeau and Roy, **1986).** For instance, furniture sold in kit-form and hypermarkets situated far from town-centres induce, respectively, household production of assembling and transport services. The cost or insufficient supply of care services for the elderly results in an increase in the production of care services in the home. Greater female participation in the labour market has an effect on market production of labour-saving goods or services in the home, such as micro-wave ovens and take-away meals.
- The low reliability of measures of the value of services produced within the household is not a convincing reason for ignoring them altogether. There are various other areas in national accounts where the quality of data is less than satisfactory. If enough thought and resources are devoted to the problem, measures of household production are not necessarily more difficult or more dubious than measures of financial services or public administration.
- Including household services in the definition of production would indeed radically change the conventional approach which relates output to paid employment: it would imply that the "unemployed" contribute to producing value in the same way as the "employed" **do** and are part of the active population. On the other hand, it does not rule out the basic distinction between market and non-market work nor would it make unemployment disappear, provided that the conventional test of "actively looking for paid work" continues to be applied in defining unemployment.

On the other hand, the sheer size of the imputation which would be needed if all non-market household production were to be included, does argue strongly against simply merging the value of household production with national accounts aggregates. This would risk jeopardising most of the conventional uses of national accounts for economic policy and analysis. **A** more flexible approach would consist in providing estimates of non-market household production as memoranda items alongside the conventional **SNA** statistics. **A** more comprehensive treatment of households' non-market production within the framework of national accounting would consist in setting

up a household satellite account in which the value of this production and its uses would be described in detail (Lützel, 1989).

This position appears all the more legitimate because the revised version of the SNA recognises that the consumption of household services "makes an important contribution to economic welfare", and that "activities such as washing, preparing meals, caring for children, the sick or the aged are all activities that can be provided by other units". The revised SNA notes that such activities are included inside the ***general*** production boundary and are excluded from the production boundary in the ***system*** of national accounts only when they are not exchanged in the market.

II. MEASUREMENT OF NON-MARKET HOUSEHOLD PRODUCTION

The first step in measuring non-market household production is to define "productive activities". Hill (1979) has proposed the "third party" criterion and this is now widely used for deciding which activities that go on within a household are to be counted as productive. Basically, productive activities are those which produce goods and services that could have been provided by some other economic unit. Cooking and cleaning are productive in this sense, since someone could be hired to perform these tasks; watching television and sleeping are not productive because they cannot be performed by a third party. The measures of household production discussed below refer only to productive activities and do not attempt to value time devoted to biological and non-productive leisure activities.

According to the third party criterion, the following household activities would generally be regarded as productive: meal preparation, washing up, cleaning the house and tidying, laundering, shopping, repair and maintenance of dwellings and household goods, sewing and repair of clothing, care of infants, children and adults in the household, accounting and book-keeping, gardening, pet care as well as travel and queuing related to these activities.

In practice, the third patty criterion comes up against borderline cases which must be resolved by reference to normal social practice and standards. For instance, bathing a child or dressing a disabled person will be classified as "housework", whereas washing and dressing oneself will not be considered as productive activities, on the grounds that they conform to normal adult behaviour. This has not always been the case: in earlier times, people were employed to wash and dress healthy adults. The classification of some activities as productive, such as travelling in privately-owned vehicles or by foot, remains controversial. According to the third party criterion, transporting oneself should be considered as a productive activity provided it is not performed as a non-productive leisure activity-such as jogging or motoring for sightseeing. As it is not always easy to make this distinction, a frequent practice is to classify travel according to purpose. Thus, walking to the shops will be classified with shopping and counted as a productive activity while cycling to a tennis club will be classified as non-productive.

Another practical difficulty is that more than one productive activity may be performed at the same time. A person may well cook whilst helping a child do its homework: he or she is then, in fact, producing two services within the same time period. If one is measuring output, then all activities should be taken into account. On the other hand, if one is measuring inputs of time, counting all simultaneous activities will lead to the paradoxical result that time spent on all activities – professional, biological, leisure and housework – exceeds the **24** hours of a day. The usual practice is to count only what the interviewees report as their main activity and to disregard secondary activities.

In the SNA, all goods and services purchased by households are treated as final consumption, but in measuring non-market household production, the goods and services consumed or transformed during the production process – electricity, detergents, raw food, material an **so** on – are now considered as intermediate consumption. Furthermore, goods used in successive productive processes during **two** or more accounting periods are now treated as fixed capital goods. The latter are made up of household durable equipment such as washing machines, refrigerators, food-blenders etc. All that will remain in final consumption expenditure are the goods and services purchased and consumed without being processed or incorporated into a new good or service. The value of goods and services produced and consumed within the household should be added to this final consumption expenditure to arrive at a measure of "total" household consumption.

The methods used to impute values to non-market household production can conveniently be divided into "output" and "input" approaches.

i) The output approach consists of imputing a money value to household production. Intermediate consumption is then subtracted to arrive at gross value added. By further subtracting net indirect taxes and consumption of fixed capital, one derives an estimate of the imputed value of unpaid household labour. This may be considered as a "mixed income" remunerating labour and capital, analogous to income from self employment.

ii) The input approach consists in imputing a money value to labour inputs directly. Fixed capital consumption, net indirect taxes and intermediate consumption are then added to obtain an estimate **of** the value of non-market household production.

To apply the output approach, it is first necessary to identify both the goods and services produced by households for own consumption and "market substitutes" for them. Market substitutes are goods or services offered on the market which are equivalent to those produced in the home. Household production is then valued at the market prices of these substitutes.

The output measurement approach can be formally expressed as:

$$HP = \sum_i \sum_j (Qij.Pi) \qquad [1]$$

where:

HP is the money value of household production at market price

Qij is the quantity of good or service i produced annually by household j

Pi is the price of the market substitute for good or service i

Direct estimates of output have been made for France (Chadeau and Fouquet, 1981*a*), the United Kingdom (Clark, 1958), and Finland (Suviranta, 1982), although rather different types of market substitutes have been used. For France, the services of restaurants and hotels are taken as substitutes for household production of meals and related services, shopping, cleaning, tidying, laundering and repairs to household goods. Output is valued at the market prices of these services. Other domestic and personal services such as care of children and adults, supervising homework, accounting and administrative work, are valued at the market wage rate of trained personnel such as nannies, nurses, tutors, private secretaries. By subtracting household expenditure related to this output, net interest paid on loans contracted to acquire dwellings and durable equipment goods and notional VAT and other indirect taxes which would have been levied had this production been sold on the market, an estimate is obtained of value added by unpaid household labour. For the United Kingdom, services rendered by institutions providing full board and lodging for children and adults are taken as substitutes for household production, and the latter is estimated at the cost of running them. For Finland, the provision of cleaning services in child care centres, of meals in state-run cafeterias and private dry-cleaners' services are chosen as substitutes for the output of house-cleaning, meal preparation and laundering services which are then valued at the cost of producing them on the market.

So far, the output approach has been implemented in only a few countries because of the lack of data on the quantities of goods and services produced within the household. Input approaches are more frequently implemented using survey data on time use, income and earnings and household expenditure.

Most studies using the input approach have concentrated on measuring the money value of unpaid labour input without going as far as providing estimates of household production. An exception is a study presenting an input-ouput table for non-market household production for Australia (Ironmonger, 1989) which estimates inputs of time as well as intermediate consumption by type of activity and derives a measure of the value of household production.

Three broad categories of methods for imputing a monetary value to housework have been developed based on different substitution patterns between unpaid labour in the home and paid work on the market. The first two, *i)* and *ii)* below, take as market substitutes persons paid to perform tasks similar to those covered by housework. The third, *iii),* substitutes for the unpaid work of household members the work they are qualified to perform on the labour market:

i) A general housekeeper is chosen **as** substitute for all the unpaid housework that household members actually do. This is called the "global substitute" method. Total housework time is then valued at a housekeeper'swage rate on the market.

ii) A variety of trained workers are chosen as substitutes to perform those tasks in the home which correspond to their specialisation on the labour market as cooks, nurses, gardeners, etc. This is called the "specialist substitute" method. Their respective market wage rates are used to estimate the value of time spent on each type of household activity matched with their specialisation.

iii) Unpaid housework is substituted by the market work the person performing housework is qualified and trained for. This is called the "potential earnings" or "opportunity cost of time" method. The housework he or she does is then valued at his or her wage rate on the labour market.

Estimates of the value of housework for each of these different methods may be formalised as follows:

The global substitute method **(GL):**

$$HW = \sum_{i} Ti.W \qquad [2]$$

where:

Ti represents time spent on housework by person i per year

W is the wage rate of a person trained in general housekeeping duties

The specialist substitute method (SP):

$$HW = \sum_{i} \sum_{j} (Tij.Wi) \qquad [3]$$

where:

Tij represents time spent performing household productive activity i by person j per year

Wi is the wage rate of a specialist worker performing task i (or its closest substitute) on the market

The potential earnings method or opportunity cost of time method (OC) :

$$HW = \sum_{s} (Ts.Ws.Ps) \qquad [4]$$

where:

Ts represents average time spent on housework per person and per year in category s of the population. Population categories are defined by criteria such as status in employment and sex which affect both time spent on housework and earning capacity

Ws is the average wage rate of category s on the labour market

Ps is the population in category s

If the aim is to obtain a measure of *foregone expense,* that is to say, the amount households would have to spend to hire someone to do the housework in their place, then all labour costs which would be incurred in the case of market work need to be included and wage rates are increased to account for them. The main additions are compulsory social security contributions due by the employer (these can be substantial, representing approximately 40 per cent of wages in France). Should the analogy with market employment be taken further, other costs incurred by employment such as food, accommodation, travel expenses may need to be added.

On the other hand, if the aim is to measure a *foregone income,* that is to say the amount of income households would have earned had they performed paid work in the market rather than unpaid work in the home, then levies made on monetary incomes should be deducted. The major ones are employees' social security contributions and income taxes. Other adjustments may be needed to account for additional expenses on travel, food or clothes for instance, and also additional receipts such as fringe benefits, premiums, etc.

The size of estimates is also affected by the lower and upper age limits of the population considered to perform housework. For a given activity there will usually be quite a wide range of substitutes to chose from: wage rates are often different in the private and the public sector and, within a given profession, the pay scale may be quite broad and wage rates may differ according to age, sex, experience and qualifications. The list of activities taken into account may be more or less extensive. On these various issues, no consensus has emerged as to the most appropriate way to proceed. In practice, though, the kind of data available often restricts the number of options.

All these methods have their drawbacks:

- Valuing time spent on housework by market wage rates implies that productivity in the household is the same as on the market: there is no evidence to support (or reject) this assumption;
- It is improbable that all housework tasks could be performed by an unqualified housekeeper, as implied in the global substitute method: some activities do require specific skills, and are not carried out equally in all households (health care or educational services, for instance);
- **It** is unlikely that households would in fact hire the variety of personnel which the specialist substitute method requires in principle;
- The "opportunity cost of time" method assumes that individuals are able to work on the labour market for as many hours as they wish in jobs suiting their professional qualifications. In fact, the alternative they are often faced with is either working full-time or being unemployed. Moreover, the potential wage rates of those involuntarily unemployed are often zero, or, at best, minimum wage rates. This implies that the value of an hour of housework is lowest for those who perform most of it.
- Wage differentials between men and women on the labour market are transferred to work in the home, without any consideration of actual expertise in performing housework.
- The "opportunity cost" method means that work resulting in the production of one good or service in the home is estimated at the value of work producing a quite different good or service on the market. Wage rates are consequently no longer related to the kind of output for which the work **is** performed and identical products are given different values according to who produces them.

III. **SOME** RESULTS

Estimates of the time spent each year on housework by men and women in five countries are shown in Table **1.** The estimates are sensitive to the population coverage which differs from one country to another. The table also shows hours of paid labour and the last column shows that time spent on unpaid housework usually exceeds time spent on paid work. In Germany and Norway hours of unpaid housework fell between the **1970s** and 1980s, whilst they increased in France during the same period. Time

Table 1. Annual estimates of worktime

Men and women

	Year	Population coverage[1]	Unpaid housework	Paid work on the market	Unpaid housework as a percentage of paid work
United States (hours billions)	1976	18 and over	188.8	155.6	121
Germany (hours billions)	1970	Over 14	50.1	50.6[2]	99
	1974	Over 14	46.4	47.52	98
	1980	Over 14	46.3	45.52	102
France (hours billions)	1975	18 and over urban	41.4	37.5	111
	1985	18 and over urban	47.3	37.0	128
Australia (hours billions)	1975	18-69	11.1	10.0	111
Norway (1 000 man years)	1972	16-74	1 730	1 530	113
	1981	16-74	1680	1 700	99

1. Applicable to estimates of housework time

2. Author's estimate: average hours worked by employees are applied to total employment.

Sources: *United* States: Unpaid housework time: Murphy (1982). Paid work on the market: author's estimate based on average hours actually worked per person per year, from the OECD Central Analysis Division Data Base which is based on country submissions and United States National Income and Product Accounts estimates of persons engaged in production. Germany: Unpaid housework: Schettkat (1985). Paid work on the market: author's estimate based on average hours actually worked per person per year by employees from the OECD Central Analysis Division Data Base which is based on country submissions. France: Author's estimates derived from unpublished data from INSEE time use surveys (1974-75 and 1985-86). Australia: Ironmonger (1989). *Norway:* Brathaug (1991).

budget surveys for France (INSEE, 1987) show that time spent on housework by men and women per day has increased by about 2 per cent. The increase in total hours of housework are attributable mainly to the growth of the urban population.

The contribution of women to housework (Table 2) varies between two thirds and three quarters of the housework time of men and women combined. Time budget surveys show that the amount of housework done by women depends on their employment status (i.e. whether they are employees, self-employed, or outside the labour force), the number of children in the household and the age of the youngest child. For instance, the study for France (Chadeau and Fouquet, 1981*b*) shows that women not engaged in the labour market spend 50 per cent more time on housework than those in paid employment and that self-employed women spend 18 per cent more time than wage earners. Whatever their status in employment, time spent on household production increases with the number of children, and is greater when the age of the youngest child is low. The percentage contribution of women computed from monetary estimates of housework is also given in Table 2. The relative contribution of women is lowest when the opportunity cost of time method is used. This is because of the difference in male and female wage rates: the fewer hours of housework performed by men are valued at higher rates than the longer hours worked by women.

Table 2. **Contribution of women to total housework**

Per cent

	Year	Housework time	Money value	
			OC	SP
United States	1976	72	60	68
France	1975	77	69	n.a.
Canada	1986	68	61	66
Australia	1986	69	66	68
Norway	1981	70	64	69

OC Opportunity cost of time method.
SP: Speaalist substitute method.
n.a.: Not available.
Sources: *United* States: Murphy (1982). France: Chadeau and Fouquet (1981*a*), (1981*b*). Canada: Statistics Canada (1991). Australia: Australian Bureau of Statistics (1990). Noway: Brathaug (1991).

Table 3 shows the distribution of time between four main types of household activity. Child and adult care take up 15 per cent to 17 per cent of time in all four countries. Shopping accounts for about the same percentage except in Finland where only 10 per cent of time is spent on this activity. In France, cooking and washing up absorbs 36 per cent of time – substantially more than in Australia and the Netherlands.

Monetary measures are shown in Table **4.** These are all based on the input approach. The value of housework is expressed as a percentage of gross domestic product **(GDP)** or of gross national product (GNP) and results are classified by estimation method – opportunity cost (OC), specialist substitute **(SP)** and global substitute **(GL).** The table also shows the effect of using different kinds of wage rates to value time – net (after tax) wages, gross (before tax) wages, gross wages plus social security contributions paid by employers.

It is clear that results are highly sensitive to the method used: the opportunity cost method always gives the highest values and the global substitute method nearly always gives the lowest. Norway is the only case where the global substitute method produces higher values than the specialist substitute method. In all cases, the money value of unpaid housework exceeds one fifth of GDP and exceeds two thirds of GDP (France) when the opportunity cost of time method is applied using gross wage rates including employers' social security contributions.

Time series for the United States, Germany, Canada and Norway show a decline in the relative magnitude of unpaid housework. It is probable that this mainly reflects the increasing participation of women in the labour market, but it may possibly also be due to increased productivity of work within the household, through labour-saving equipment such as washing machines, dish-washers, micro-wave ovens and food

Table 3. Distribution of time by household activity

Per cent

	France 198886[1]	Australia 1975-76[2]	Finland 1982	Netherlands 19882
Cooking Washing up	36.2	26.1	31.9	27.7
Cleaning Laundering Repairs Other housework[3]	30.2	42.2	43.1	38.9
Childcare Adultcare	16.3	15.4	15.3	16.8
Shopping	17.3	16.3	9.7	16.6
Total	100.0	100.0	100.0	100.0

1. Travel time is shared between child care and shopping.
2. Education and volunteer work is excluded.
3. Includes gardening.
Sources: France: INSEE (1987*a*). Australia: Ironmonger (1989). Finland: Suviranta (1982). Netherlands: Aldershoff (1983).

blenders and through labour-saving goods such as peeled vegetables, TV dinners and throw-away goods. Estimates based on the input approach cannot take account of productivity change and, consequently, give a negative bias to growth trends of household production if productivity is rising.

Table 5 compares the value of housework (estimates using gross wages) with private expenditure. Both aggregates are shown in dollars using purchasing power parities for private consumption. Whatever valuation method is used, unpaid household activities are clearly a very important component of total household consumption.

Few studies provide time series of estimates of the value of unpaid housework, and those which do (the United States, Germany, Canada) use nominal wage rates. In order to assess the effect that the inclusion of housework would have on growth of real income, gross disposable income and housework have been deflated by the price index of private final consumption. Table 7 gives growth rates of real disposable income of households excluding and including the value of housework. Aggregates are expressed in billions of units of national currency at **1985** prices. The different measures of "total" real disposable income correspond to different estimates of housework – net or gross wages, opportunity cost of time or specialist substitute methods. In general, the inclusion of housework reduces the growth of real disposable income of households, although the braking effect is less marked when the specialist substitute method is used.

The effect the inclusion of household production has on growth rates of gross domestic product is illustrated in Table *8.* Housework is deflated in the same way as in

Table 4. Money value of housework

Per cent of GDP or GNP

	Year	Populationmverage	Method		
			OC	SP	GL
			A. Net average rates		
United States	1960	16 and over	38	37	n.a.
	1970	16 and over	37	34	n.a.
	1976	18 and over	44	n.a.	n.a.
Germany	1964	Over 14	37	27	n.a.
	1970	Over 14	34	25	n.a.
	1974	Over 14	30	23	n.a.
	1980	Over 14	29	22	n.a.
Canada	1961	15 and over	44	39	n.a.
	1971	15 and over	40	41	n.a.
	1981	15 and over	35	n.a.	n.a.
	1986	15 and over	33	n.a.	n.a.
			B. Gross average wage rates		
United States	1976	18 and over	60	44	32
Germany	1964	Over 14	47	34	n.a.
	1970	Over 14	45	33	n.a.
	1974	Over 14	43	32	n.a.
	1980	Over 14	42	32	n.a.
France	1975	18 and over	44	n.a.	28
	1985	15 and over	n.a.	46	33
Canada	1981	15 and over	51	43	21
	1986	15 and over	48	41	22
Australia	1975	18-69	41	n.a.	n.a.
	1986	15 and over	55	49	n.a.
Norway	1981	16-74	40	n.a.	n.a.
			C. Gross average wage rates including employers' social security contributions		
France	1975	18 and over	68	n.a.	44
	1985	15 and over	n.a.	64	36
Finland	1980	10 and over	n.a.	n.a.	42
Norway	1972	16-74	n.a.	50	53
	1981	16-74	n.a.	39	41

Table 5. **Value of housework and private consumption**

Values of housework based on gross wages

	Year	Value of housework						Private consumption
		National currency US$ billions			Current PPPs US$ billions			Current PPPs US$ billions
		Method			Method			
		OC	SP	GL	OC	SP	GL	
United States	1976	1015	752	540	1015	752	540	1123
Germany	1980	621	475	n.a.	226	173	n.a.	309
France	1975	634	n.a.	411	118	n.a.	76	163
Canada	1986	243	208	113	194	166	90	240
Australia	1986	143	129	n.a.	108	98	n.a.	116
Norway	1981	130	n.a.	n.a.	15	n.a.	n.a.	20

OC: Opportunity cost of time method.
SP: Speaalist substitute method.
GL: Global substitute method.
PPP: Purchasing power parity.
n.a.: Not available.
Sources: Values of housework: United States: Murphy (1982). *Germany:* Schettkat (1985). France: Chadeau and Fouquet (1981*b*). Canada: Statistics Canada (1991). Australia: Australian Bureau of Statistics (1990). *Norway:* Brathaug (1991). PPPs: The OECD National Accounts Data Base which is based on country submissions. Private consumption: OECD (1991).

	Year	Housework per capita Current PPPs US$			Private consumption per capita Current PPPs US$	Housework as a percentage of private consumption		
		Method				Method		
		OC	SP	GL		OC	SP	GL
United States	1976	4655	3448	2477	5 150	90.4	67.0	48.1
Germany	1980	3 671	2810	n.a.	4 917	73.8	56.5	n.a.
France	1975	2 324	n.a.	1 497	3 028	76.7	n.a.	49.4
Canada	1986	7646	6542	3547	9 246	82.7	70.7	38.4
Australia	1986	6742	6118	n.a.	7 363	91.6	83.1	n.a.
Norway	1981	3 658	n.a.	n.a.	4 466	81.9	n.a.	n.a.

OC: Opportunity cost of time method.
SP Specialist substitute method.
GL: Global substitute method.
PPP: Purchasing power parity.
n.a.: Not available.
Sources: Housework and private consumption: taken from table 5. Population: OECD (1991).

Table 7. Growth rates of gross disposable income including and excluding the value of housework

Country	Year	GDI 1985 prices National currency (billions)	Growth rate of GDI (per cent)'	GDI + housework 1985 prices National currency (billions)		Growth rate of GDI + housework (per cent)'	
				OC	SP	OC	SP
				A. Net wage rates			
United States	1960	1255		1891	1877	..	
	1970	1907	4.3	2 839	2 770	4.1	4.0
Germany	1964	608		968	867		
	1970	846	5.7	1300	1178	5.0	5.2
	1974	973	3.6	1434	1322	2.5	2.9
	1980	1 159	3.0	1670	1550	2.6	2.7
Canada	1961	108		173	167		
	1971	178	5.1	284	287	5.1	5.6
	1981	303		461	n.a.		n.a.
	1986	333	1.9	493	n.a.	1.4	n.a.
				B. Gross wage rates			
Germany	1964	608		1059	933		
	1970	846	5.7	1451	1289	5.4	5.5
	1974	973	3.6	1633	1472	3.0	3.4
	1980	1 159	3.0	1905	1729	2.6	2.7
Canada	1981	303		531	497		
	1986	333	1.9	567	534	1.3	1.4

Table 7 and GDP is estimated at 1985 price levels. Although net wages are not an appropriate concept when calculating the contribution to GDP, estimates of housework using these wages are included in this table because they are the only data available for the United States and for Canada (1961-71). The inclusion of housework in GDP affects growth rates of output in a less uniform manner than is the case with disposable income. In most cases, including housework lowers GDP growth rates, although the inclusion of housework leaves growth rates unchanged in the United States and Germany between **1964** and 1970 when net wage rates are used, and it increases German growth rates during the same period when gross wages are taken.

Table 8. Growth rates of gross domestic product including and excluding the value of housework

Country	Year	GDP 1985 prices National currency (billions)	Growth rate of GDP (per cent)'	GDP + Housework 1985 prices National currency (billions)		Growth rate of GDP +housework (per cent)'	
				A. Net wage rates			
United States	1960	1805		2 441	2 427	..	
	1970	2 628	3 8	3 560	3 491	3.8	3.7
Germany	1964	1203		1383	1 282		
	1970	1324	4.4	1779	1 657	4.3	4.4
	1974	1490	3.0	1952	1 839	2.3	2.6
	1980	1 728	25	2 239	2 119	2.3	2.4
Canada	1961	164		229	223		
	1971	278	5.4	384	387	5.3	5.7
	1981	426		584	n.a.	..	n.a.
	1986	490	2.8	650	n.a.	2.2	n.a.
Germany	1964	1023		1475	1 348	..	
	1970	1 324	4.4	1929	1 767	4.6	4 6
	1974	1490	3.0	2 150	1 989	2.7	3.0
	1980	1 728	25	2 474	2 298	24	2.4
Canada	1981	426	..	653	620	..	
	1986	490	2.8	724	691	2.1	22

1. Growth rates are annual average rates of change between the dates in the second column
GDP: Gross domestic product.
OC: Opportunity cost of time method (used for valuing housework).
S P Specialist substitute method (used for valuing housework).
n.a.: Not available.
..: Not applicable.
Sources: Estimates of housework: *United States:* Murphy (1978). Germany: Schettkat (1985). Canada: Adler and Hawrylyshyn (1978), Statistics Canada (1991). Gross domestic product and GDP price index: OECD (1991).

IV. CONCLUSIONS

Whatever valuation method is used, the value of unpaid housework is substantial in relation to GDP. Non-market household production is an important component of household income, consumption and welfare.

The data contained in this paper show that estimates of the value of household production are highly sensitive to the method used. Conceptually, the output approach is more satisfactory in that it values goods and services produced in the household at the price at which they are available on the market; this is how output is generally valued in the national accounts. To date, it has rarely been applied in practice because of the lack of quantitative and qualitative data on what households actually produce. Although the "opportunity cost of time" method has been implemented in a number of studies, this method is not very plausible as it imputes different values to identical services depending on who produces them. In addition, it values services produced in the household at the cost of producing quite different goods or services on the market. The "global substitute" method usually produces the lowest values and this may be seen as an advantage by those who wish to be conservative in making imputations in the accounts. On the other hand, it rests on the non-tested assumption that housework requires low qualifications. A more plausible and at the same time feasible approach is the specialist substitute method which differentiates between the various types of household tasks and relates wage levels to the type of work performed.

While conventional SNA statistics have a number of uses that do not require estimates of non-market household production and that may even be compromised by their inclusion, they give a grossly distorted picture of the magnitude, composition and trends of productive activities. Satellite accounts are one way of providing a more comprehensive picture of production while retaining familiar measures of national income and product. One fruitful way to proceed would be to strengthen the basis for implementing the output approach by carrying out detailed surveys of household production every five years or so. The specialist substitute method could be used both to value activities for which only data on labour inputs can be obtained and to interpolate between surveys.

For the last fifty years, national income statistics have been widely used for monitoring economic developments, for designing economic and social policies and for evaluating the outcomes of those policies. Had household production been included in the system of macro-economic accounts, whether as an integrated part of the SNA or as a separate but comparable component, governments would have had quite a different picture of economic development and may well have implemented quite different economic and social policies. To take an example, Zick and Bryant (1985) have shown that inequalities in the distribution of income are reduced when household production is added to household money incomes. Their findings have implications for welfare and social policy.

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