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HOUSEHOLDS' NON-SNA PRODUCTION: LABOUR TIME, VALUE OF LABOUR AND OF PRODUCT, AND CONTRIBUTION TO EXTENDED PRIVATE CONSUMPTION

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This paper first shows, with data from fourteen countries, the potential of time-use studies for measuring, in comparable physical quantities, labour inputs in SNA and in non-SNA production. It then presents the monetary valuations of unpaid household labour and of households' non-market product achieved on the basis of time-use data in a few of these countries. Further elaboration of these valuations illustrates the contribution of households' non-SNA production to extended private consumption. The conclusion suggests desirable future developments.

1. INTRODUCTION

SNA 1993 distinguishes between two production boundaries. The general production boundary includes all activities... "using inputs of labour, capital, and goods and services to produce outputs of goods and services" (para. 6.15). The System production boundary is more restricted; "the own-account production of domestic and personal services by members of the household for their own final consumption has traditionally been excluded from measured production in national accounts"... (paras. 6.17 and 6.19).

SNA 1993 suggests that households' production for own consumption be handled in a satellite account, i.e. a flexible frame allowing for alternative concepts of Gross Domestic Product based on an extended production boundary including estimates for household production of services for own use (paras. 21.4, 21.18, 21.46 and 21.47) and also allowing for better integration of monetary and

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physical data. The satellite account is linked to the central framework which provides data to the satellite, but the two remain separate thus preserving the traditional uses of national accounts aggregates.

Labour statistics are linked to the SNA system boundary; hours worked in non-SNA activities thus go totally unrecorded. Labour statistics provide data on hours worked in SNA activities and so do time-use studies; however, the two sets of data are not compatible because of different data collection methods. The comparison between time invested in SNA and non-SNA activities can only be achieved by means of time-use studies which record both in a single operation.

This paper reflects some of the attempts which have been made for assessing the economic significance of production which lies between the two boundaries, referred to as "*non-SNA production*" as opposed to "*SNA production*" which lies within the System. Using available measures, the paper then proceeds to illustrate the contribution of households' non-SNA production to consumption and to illustrate some socio-economic implications of this analysis.

2. Labour Inputs: Measurement in Time Units

Time-use studies require individuals in a representative sample of the population to each fill a 24 hours diary and to indicate, at 15 minutes intervals, all their successive activities. The diaries are then analyzed, activities are categorized and coded according to a classification scheme, and average durations are calculated.

Time-use measurements have the following characteristics which qualify them as a satisfactory tool for the economic assessment of non-SNA activities: they are the result of direct observations, they can be used as such without requiring any theoretical assumptions, and they are eminently fit for international comparisons, the time unit being universal. Time-use methodology is progressing rapidly towards co-ordination and comparability between national studies, in particular in the context of Eurostat's Time Use Survey.

It should however be remembered that time-use does not measure human effort, i.e. it makes no difference between one hour worked in harsh circumstances and one hour worked in more comfortable circumstances: time spent in laundering in the cold water of a stream or time spent in operating an electric washer-dryer are very different from the human point of view.

The time-use data utilized in this paper stem from fourteen countries for which relatively recent measurements were available in 1994: Australia, Austria, Bulgaria, Canada, Denmark, Finland, France, Germany, Great Britain, Israel, Italy, Netherlands, Norway and United States. Some methodological differences existed between the time-use studies performed in the various countries. It was possible to partly eliminate those relating to the age groups under observation and to the categorization of activities. Some methodological differences however could not be eliminated post-facto, e.g. handling of non-response, of seasonal variations and of transportation time.

For economic analysis purposes, the activities are categorized as:

- *SNA production activities*,

- *non-SNA production activities* (food preparation, child care, adult care, making and care of textiles, upkeep of dwelling and surroundings, repairs and maintenance of dwelling and of household equipment, household management and shopping, gardening and pet care) and unpaid work for the community;
- *non-economic activities*, sometimes called *personal activities* (physiological and recreational activities and self-education[1]); they can be identified by means of the "third party criterion" which states that their performance cannot be delegated to a person other than the one benefiting from them (Reid, 1934).

Grossly summarized, the time-use studies (reported in detail in Goldschmidt-Clermont and Pagnossin-Aligisakis, 1995) yield the following orders of magnitude:

- in the fourteen countries, *economic activities (SNA plus non-SNA) require on average less than one-third of the 24 hours day*, ranging from country to country between 6:00 and 7:40 hours per day;
- in eight countries, *non-SNA activities absorb roughly as much labour time as SNA activities*, while in all other countries but one *non-SNA activities absorb more time than SNA activities*;
- in six countries, *gender equality is achieved, on average, in amount of economic time* while in the other countries, *women work more hours than men*;
- in all countries but one, the largest share of their labour time is spent by *men in SNA activities and by women in non-SNA activities*;
- in all countries but one, *food preparation requires the largest share of non-SNA time.*

Trend data for three countries show a decrease in economic time of the total population and of each gender, a trend towards equalization of genders' contribution to economic time, a decrease in production time for traditional household goods and services with the exception of child care, and an increase in household management and shopping time.

3. Labour Inputs: Monetary Valuation

By definition, non-SNA labour is unpaid; most available studies value it by imputing a market wage to the hours invested in household production. Several kinds of market wages have been used for this imputation (for a methodological discussion, see Goldschmidt-Clermont, 1982 and 1993a). Contributors to the present piece of research provided valuations based on wages of polyvalent substitute household workers (generalists), i.e. workers who can perform, within the household premises, all or most of the productive activities performed by unpaid household members. It is important to note that for national accounting purposes, it would be preferable to value non-SNA labour as mixed income derived from production. Thus the valuations presented here are not entirely satisfactory from

[1]Education is an investment in human capital as are investments in health: it produces returns in all activities, SNA, non-SNA and personal; although it may have economic consequences, it does not meet the third person criterion (nobody can learn for someone else) and should therefore be classified among non-economic activities and not among economic activities as a few authors suggest.

a conceptual point of view; they provide however a tool for illustrating some of the analyses that can be achieved with measurements of households' non-SNA production.

Net or gross wages? There is no general agreement as to which are best. We think that the choice between the two depends on the use to be made of the valuation results. Gross wages reflect which flows would be generated, if production was transferred from households to the market; they also reflect households' foregone expense and can therefore be used for the analysis of households' economic behaviour. Net wages reflect the economic flows actually generated by non-SNA activities.

In the national source studies, net wages are defined in the same way and gross wages always include income taxes. However differences in the definition of gross wages appear between the national studies: in some, they include part or all labour costs, hours paid but not worked, various employment benefits (subsidized meals, subsidized vacation hostels, etc.); the largest differentiating item consists of employers' social security contributions which may amount up to 50 percent of the net wage while in other countries social security is financed from public funds. The impact of these differences on the imputed value of labour is illustrated by data available from a few countries, where more or less inclusive wages of household substitutes were imputed on the same time data sets. In the French 1985 and in the German 1992 data, the estimates based on labour costs are respectively 3 and 9 percentage points higher than those based on gross wages. In the Danish 1987 and in the German 1992 data, the estimates based on labour costs are respectively 16 and 23 percentage points higher than those based on net wages (see Table 1). Other differences exist between countries by the way hourly wages of substitute household workers are determined: for instance, they can be determined on an hourly basis (in this case, hours not worked are not counted), or on the basis of monthly rates (counting contractual hours or only hours actually worked); Schaefer and Schwarz (1994) calculated the non-negligible impact of these choices on the German valuation. These differences partly explain the range of results obtained in the various estimates.

The very large diversity of valuation methods currently used in studies of non-SNA production was partly reduced in the present piece of research by a standardization effort: choice of the same category of wages for the imputation, distinction between net wages, gross wages and labour costs; the valuation picture is thus somewhat clarified. However, because of the remaining differences in wage determination and time-use data collection (see Section 2), the values of non-SNA labour thus obtained are not comparable in detail country by country.

Grossly summarized, the valuations (reported in Goldschmidt-Clermont and Pagnossin-Aligisakis, 1995) yield the following orders of magnitude, taking the national GDPs as measuring rods:

- with *labour costs*, seven estimates provided by five countries obtain a median *value of non-SNA labour of* 45 ± 10 *percent of GDP*;
- with *gross wages*, two estimates provided by two countries, obtain a value of 39 ± 6 *percent of GDP*;
- with *net wages*, two estimates provided by two countries, obtain a value of 26 ± 5 *percent of GDP*.

4. Household Product: Monetary Valuation

Methodologically two alternatives are available for the monetary valuation of household product: the first one consists of directly valuing household output at the prices of equivalent market products; the second one consists of valuing household output at cost of inputs.

Direct valuation at market prices. In national accounting, this is the *preferred method* (System of National Accounts, 1993, para. 6.85). This preference, set forth for goods and services produced for own final use and included within the system's production boundary, should also apply to non-SNA production in the satellite account (Goldschmidt-Clermont, 1993a, b). This output-based valuation method requires the measurement in physical quantities of household outputs: for instance, number and kinds of meals prepared, number of children taken care of, kilogrammes of laundry washed, etc. These outputs were measured sporadically for certain activities in a few countries; Finland is the only country to have measured the outputs of all household activities, and to have done this on a national representative sample, without however using these physical quantities for valuation (Finland, 1980–86). Once the value of non-SNA production is obtained by imputing the prices of equivalent market products, the corresponding mixed income may be calculated by subtracting the value of intermediate inputs and of fixed capital consumption. The result corresponds to returns to labour; divided by the number of labour hours, it yields the hourly returns to labour, a value which would be interesting to compare to market wages.

Valuation at cost of inputs. Although conceptually preferable, the direct method just described requires data bases on the volume of outputs which have not been widely developed yet. As a consequence, most of the available studies have valued household production at cost of inputs, i.e. as the sum of (imputed) labour value, intermediate consumption and fixed capital consumption. They value labour by imputation of a market wage (see Section 3).

The valuations reported here are performed at cost of inputs. They are not cross-nationally comparable because of differences in the basic time-use data (Section 2), in wage determination (Section 3), in the handling of intermediate and capital consumption, in inclusiveness, etc.; these differences account for part of the range of valuation results.

Table 1 presents the value of labour and the value of production at cost of inputs, in non-SNA activities, for seven countries. These values are expressed as a percentage of GDP; they yield orders of magnitude summarized here in qualitative terms in order to emphasize their uncertain level of accuracy:

- the three lower bound estimates of the *value of non-SNA product* obtained with total *labour costs are close to half the value of GDP*;
- one estimate of the value of non-SNA product obtained with *net wages is equal to one third of GDP.*

5. Further Elaborations of Monetary Valuations

The results reported in Sections 3 and 4 are what might be called the "usual" measurements. New paths are explored in the present section. Only a limited

TABLE 1

VALUE OF LABOUR AND OF PRODUCTION IN SNA AND NON-SNA ACTIVITIES
(percent of GDP)

Country Survey Date	Value of Labour				Value of Production			
	SNA[a]	Non-SNA[b]			SNA[c]	Non-SNA[d]		
		Net Wages	Gross Wages	Labour Costs		Net Wages	Gross Wages	Labour Costs
Australia 1992[e]	51			72	100			86
Denmark 1987[f]	56[g]	21[g]		37[g,h]	100			43[h]
Finland 1990[i]	56			45	100			46
France 1985[j]			33	36	100			
Germany 1992[k]	55	31	45	54	100	33	47	55
Norway 1990[l]				38	100			
Bulgaria 1988[m]	85				100	47	71	84

[a] Compensation of employees.
[b] Imputed wages of substitute household workers (generalists).
[c] GDP.
[d] Gross value added at cost of inputs.
[e] Ironmonger, 1994. Population aged 15+.
[f] Population aged 16–74.
[g] Møllgaard and Rørmose, 1995.
[h] Bonke, 1993.
[i] Vihavainen, 1995 and Hamunen, 1994. Population aged 15+.
[j] Chadeau, 1992. Population aged 15+.
[k] Schaefer and Schwarz, 1994. Population aged 16+; Old Länder only (i.e. former territory of the Federal Republic of Germany).
[l] Dahle and Kitterød, 1992. Population aged 16–79.
[m] Zachariev, Todora, Tcsekova, and Mantchevska, 1994. Population aged 0.1 year+(i.e. the entire resident population), thus a different population basis than in the other studies; the values of labour and production are affected by this difference (for details, see Goldschmidt-Clermont and Pagnossin-Aligisakis, 1995).

number of examples are provided, but they indicate directions which may be pursued further. A clarification of concepts is first required.

Extended private consumption. "Extended" refers to SNA plus non-SNA; it applies to such concepts as economy, product, labour, consumption, etc. Households' extended private consumption consists of what they buy and consume without further processing (e.g. an ice-cream cone) plus what they produce themselves and consume directly.

Private consumption, in the SNA perspective, is assumed to be households' final consumption. However it includes goods and services which are used as intermediate inputs in non-SNA production (e.g. vegetables), and which will be transformed in the final product to be consumed (e.g. a soup); it also includes durables some of which are used in production (e.g. refrigerators). SNA assumes

all durables are consumed at the moment they are bought, while in the extended economic perspective, productive durables are consumed gradually over their life time and are accounted for as input in production.

In the extended production perspective, intermediate inputs and durables used for production are deducted from SNA private consumption. In other words, in the satellite account, a value, provided by the central framework, is modified in order to be incorporated in the extended accounting system. This new value is called SNA *modified private consumption.*

Extended private consumption is the value obtained by adding up SNA modified private consumption and households' non-SNA product.

Table 2 shows estimates of the contribution of non-SNA production to extended private consumption. The estimates provided by Finland, Germany and Bulgaria are close: *non-SNA production contributes some 60 percent of extended private consumption*

TABLE 2

CONTRIBUTION OF NON-SNA PRODUCTION TO EXTENDED PRIVATE CONSUMPTION

(percent of extended private consumption)

	Private Consumption		
	Extended[a]	SNA modified[b]	Non-SNA
Finland 1990[c]	100	37	63
Germany 1992[d]	100	38	62
Bulgaria 1988[e]	100	42	58

Notes: Percentages rounded off at the nearest unit.

[a]Extended private consumption consists of what households buy and consume without further processing (e.g. an ice cream cone) plus what they produce themselves and consume directly.

[b]SNA private consumption minus goods and services used in non-SNA production (i.e. intermediate inputs and consumer durables).

[c]Statistics Finland 1994.

[d]Schaefer and Schwarz, 1994. Old Länder only, i.e. former territory of the Federal Republic of Germany.

[e]Tcsekova, 1994.

Table 3 provides, with data from Bulgaria, a trans-temporal illustration of the contribution of non-SNA production to extended private consumption.[2] According to the Bulgarian source (Ilieva and Mantchevska, 1994), per capita extended private consumption appears to have decreased, between 1971 and 1988, from US$ 2,736 to US$ 2,137. This US$ 600 decline results from a decline in SNA consumption (US$ 75) aggravated by a large decline in non-SNA consumption (US$ 525). During this period, non-SNA contribution to extended consumption decreased from 65 to 58 percent. These observations, if confirmed, would contradict the widespread belief that households can compensate a loss in market consumption by increasing their non-market economic activity; a possible explanatory hypothesis is that non-market production is partly dependent on

[2]The authors wish to express their special gratitude to Jana Ilieva of the Bulgarian National Statistical Institute and Mantchevska of the V. T. Bank in Sofia who calculated the data as a reply to a question addressed to participants in the study.

TABLE 3

BULGARIA 1971, 1977 AND 1988: CONTRIBUTION OF NON-SNA PRODUCTION TO EXTENDED PRIVATE CONSUMPTION

	Per Capita Private Consumption[a]					
	Extended[b]		SNA Modified[c]		Non-SNA[d]	
1971						
US$[e]	2,736		963		1,772	
%		100		35		65
1977						
US$[e]	3,198		1,244		1,954	
%		100		39		61
1988						
US$[e]	2,137		899		1,248	
%		100		42		58

Notes: Percentages rounded off at the nearest unit.

[a]Ilieva and Mantchevska, 1994.

[b]Extended private consumption consists of what households buy and consume without further processing (e.g. an ice cream cone) plus what they produce themselves and consume directly.

[c]SNA private consumption minus goods and services used in non-SNA production (i.e. intermediate inputs and consumer durables).

[d]Value of production in non-SNA activities (labour input calculated on net wages of substitute household workers, polyvalent).

[e]Values expressed in US$ at estimated PPPs of the year under consideration 1 BGL = 1.170 US$ (1971); 1.075 US$ (1977); 0.410 US$ (1988).

TABLE 4

BULGARIA 1971, 1977 AND 1988: LABOUR TIME AND EXTENDED PRIVATE CONSUMPTION

	Observed		Standardized	
	Extended Labour Time Per Person[a] (h:m/day)	Extended Private Consumption Per Capita[b] (US$)[c]	Extended Labour Time Per Person (h:m/day)	Extended Private Consumption Per Capita (US$)[c]
1971	8:40	2,736	8:00	2,516
1977	8:19	3,198	8:00	3,075
1988	7:03	2,137	8:00	2,440
1971–88 decline	18.6%	22%		3%

Notes:

[a]Niemi and Anachkova, 1992.

[b]Ilieva and Mantchevska, 1994.

[c]Values expressed in US$ at estimated PPPs of the year under consideration: 1 BGL = 1.170 US$ (1971); 1.075 US$ (1977); 0.410 US$ (1988).

market production: for instance, if no paints are available, or if no money is available for buying paints, households do not repaint their dwellings.

Standardized extended private consumption. Extended consumption can be compared across countries, across time, across population groups. Such comparisons can however be very misleading from the socio-economic point of view

because they do not account for differences in the amount of labour required for achieving the consumption levels under consideration: a given consumption level reached with lower labour inputs may be considered more favourable from the human point of view, as less economic time means availability of more personal time. It is possible to overcome this problem by integrating the two data sets: consumption levels and labour time. This can be achieved by standardizing labour time. The procedure, used in Malaysia by Kusnic and Da Vanzo (1980), consists of hypothesizing the same amount of labour time for both entities to be compared (e.g. countries) and of calculating what consumption would have been in each if labour time had been equal to the chosen standard. By applying this procedure to extended labour and extended consumption, a value is obtained called *standardized extended private consumption.* The procedure is illustrated with Bulgarian data.

Table 4 shows that between 1971 and 1988, in Bulgaria, per capita extended private consumption declined by 22 percentage points while per capita extended labour time declined by 18.6 percentage points. In the present study, extended labour was arbitrarily standardized at 8 hours per person per day. The standardized data indicate that the decline in consumption is strongly related to the decline in economic time: if Bulgarians had worked the same amount of time in both years, the decline in consumption would only have been of 3 percentage points.

The same procedure, applied to cross-national data or across socio-economic groups within one country, would allow meaningful comparisons permitting integrated appraisals of levels of living.

6. Conclusions

Time-use measurements clearly have a potential for assessing the economic dimensions of human labour. Perhaps the most important indication they give is that, at the macro-economic level, labour inputs into non-SNA activities are of the same order of magnitude as labour inputs into SNA activities. Labour statistics record only the latter; they do not account for about one-half of human labour. Due to this enormous gap, labour statistics give a distorted image of how even industrialized societies utilize the available labour resources for achieving their standard of living.

The available *national valuations of households' non-SNA production* yield interesting orders of magnitude. In order to serve as a basis for the formulation of economic and social policies, they would require further elaboration: for example, the assessment of the respective contributions of SNA and non-SNA activities to extended private consumption.

Due to different choices made during the valuation process, the range of values presently available is wide. In order to achieve cross-national comparability, methodological recommendations have to be developed internationally. Valuation methodology is progressing at a much slower pace than time-use methodology. Monetary valuations have been produced in several countries for many years, but the field lacks co-ordination: it progresses in dispersed order; the only

international conference on the subject was held in 1993 in Ottawa at the initiative of Statistics Canada.

In order to be compatible with SNA data, a different valuation method will have to be used: the valuation will have to be output-based, i.e. it will have to start with the physical measurement of household output and value it at market prices (Goldschmidt-Clermont, 1987, 1989, 1993b). Unfortunately very little experience is available, as yet, with this approach at national levels. It is, however, not more difficult to develop than the refined strategies developed for the traditional sectors of the national accounts.

Time-use based valuations are inappropriate for studying extended income distribution. Non-market time is more elastic than monetary income and is used at the discretion of households: in order to save on expenditures, households with low monetary income may devote time to production for own-consumption even if it yields low hourly returns. Diminishing returns are ignored when households' non-SNA incomes (and thus extended incomes) are calculated on the basis of unpaid labour time multiplied by an imputed wage. Because of diminishing returns to labour and because of more hours of work, households with low monetary income may, with time based valuations, appear better off than they actually are. In order to avoid this difficulty, output-based valuations are necessary.

For the monetary valuation of households' non-SNA production to progress, it is necessary:

- to develop contacts, systematic exchange of information and co-ordination between those involved in the field;
- to develop output-based valuation methodology and data collection;
- to allocate the necessary financial resources for the development of this until now neglected sector of economic accounting.

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