

THE SIZE OF HOUSEHOLD PRODUCTION: METHODOLOGICAL PROBLEMS AND ESTIMATES FOR THE FEDERAL REPUBLIC OF GERMANY IN THE PERIOD 1964 TO 1980¹

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Household production as well as other informal economic activities have received scant attention in economic science. In the last decade the view has been taken that there has been a big shift from formal to informal production. In order to examine this trend this article presents estimates for the size of household production for the Federal Republic of Germany which are based on time-budget data collected from 1964 to 1980. To show the sensitivity of the results two different estimating methods the Opportunity Cost Method and the Market Cost Method, are used. Since productivity growth took place not only in the formal economy but also in household production, estimates will be presented which take productivity growth explicitly into account. The article concludes with a comparison of estimates for other countries.

1. WHY MEASURE HOUSEHOLD PRODUCTION?

Household production and other informal economic activities are by convention not included in GNP. This does not have any effect on *growth rates* of economic output, which are of main interest, if both sectors—the formal and the informal one—are growing at the same rate. Since the industrial revolution, more and more economic activities have shifted from households to the market and/or the public sector. To some extent, measurement of economic growth in the past overestimated effective change since it merely reflected a transfer in accounting terms of productive resources from the unobserved (informal) sector to the observed (formal) sector (see Bombach [3]).

But even this shift from households to the market and public sector left much work remaining in the former sector. Nonetheless, household activities have received scant attention in economic science. Recently the view has been expressed that there has been a large shift back from markets to households (see for example Burns [4]). The reasons for this return include economic incentives, more self-fulfillment in household work, and production geared more directly to personal needs. Indirect supporting evidence for this trend include general working time reductions and the increasing productivity of tools and other equipment used in household activities.

In order to examine the stated trend this article presents estimates for the size of household production for the Federal Republic of Germany (FRG) that are based on time-budget data collected from 1964 to 1980. To show the sensitivity of the results two different estimating methods, the Opportunity Cost Method and the Market Cost Method, are used. The estimates will be corrected for productivity growth, which took place not only in the formal economy but also in household production.

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The article concludes with a comparison of estimates for other countries. All the other studies are based on time-budget data collected in one year and the amount of time spent in household production is held constant for certain demographic categories over time. So, variations in the estimates in these studies are based only on changes in the demographic structure of society and on wage growth. None of these studies takes productivity growth in household production explicitly into account. This can affect results especially in trends of variables.

2. PROBLEMS OF ESTIMATING THE VALUE OF HOUSEHOLD PRODUCTION

Without doubt, the best way to account for household production would be to measure the output itself directly. But here a problem arises which is parallel to that of measuring the output of public production. Goods and services produced by the public sector or in households are usually not sold on the market and, therefore, there is no market price as a measure of the value of their production. The convention adopted in national accounting to evaluate public sector production is to take the costs (mainly wages of state employees) as an estimate for the value of output. So, for example, one assumption is that there is no equivalent to profit in the public sector. Although it is easy to measure public sector factor costs, the difficulties of valuing household production are more complicated because there are no wages paid. This has led many researchers to estimate the value of household production at the macro-level by means of time-inputs based on time budget studies.

Although we know the time spent in household production from time budget studies, it is still questionable whether the measured time relates sensibly to output. It is possible that time-inputs overestimate the necessary time for production because time is not used effectively in an economic sense. Joan Vanek showed that full-time housewives spend a lot more time in household production than wives engaged in both sectors (see Vanek [7]). Full-time housewives spend, on the average, 29 hours more in housework per week than employed wives. This difference cannot be explained by the amount of housework undertaken by the husbands, since for both types of wives husbands work an insignificant amount of time within the house. It also cannot be explained by the number of children in the household or by the age of children. Vanek's explanation for this difference is that full-time housewives are demonstrating their economic value to the family more by the amount of time-inputs than by the effective use of each unit of time. In other words, it may be assumed that a part of the time spent in housework by full-time housewives is wasted in a strictly economic sense. But this example further illustrates that there are other factors influencing household production besides economic ones. Social relationships seem to be more important in this sector than in the formal economy. Unfortunately, however, time-inputs are the most satisfactory data we can use as the basis for estimating household production.

The time-input data used for estimates of household production in this article are taken from large-sample surveys carried out for the German television stations in several years beginning in 1964. The diaries cover every day of the week and each day is represented by a sample of diaries. Theoretically, the data can be disaggregated by socio-demographic variables. Unfortunately, they are not pub-

lished in very great detail. For the published data no disaggregation is possible; the data relate to the whole population of the FRG over the age of 14 years. From 1964 to 1980 the data show a declining trend in time spent in household production on average (see Table 1). This trend is in addition to changes in time-use patterns partly influenced by demographic changes. But the same trend appears in the United Kingdom mainly due to changes in time-use patterns (see Gershuny [8]).

TABLE 1
THE TIME BUDGET DATA
(hours per day)

Year	Household Work and Shopping
1964	3.08
1970	2.92
1974	2.60
1980	2.53

Source: Bundesregierung, Gesellschaftliche Daten, Bonn, January 1982.

If we would conclude from the fall in time-inputs that there has been a decrease in production, we would most likely be mistaken. For instance, by analogy, measuring the formal economy in the same way would have shown a drop in output over the past decades, since average working hours have fallen. Of course, a key missing variable is changes in productivity. The fact is that the output of the formal economy increased despite working time reductions because of more than offsetting productivity growth due, for example, to changes in technological input. Households, like the formal economy, have also experienced significant changes in technical inputs, as shown in Table 2.

TABLE 2
TECHNICAL EQUIPMENT IN PRIVATE HOUSEHOLDS
(as percent of all households)

	Type of household							
	2 (middle income)				3 (higher income)			
	1965	1970	1975	1980	1965	1970	1975	1980
Washing machine	68.1	84.1	97.9	99.2	70.2	91.3	97.3	99.1
Dishwasher	1.1	2.1	9.5	25.7	2.5	9.7	39.5	62.4
Refrigerator	85.6	94.4	98.7	100.0	96.9	98.2	97.8	100.0
Ironing machine	3.7	9.4	15.9	18.3	10.1	10.9	21.3	22.1
Car	30.2	51.0	74.2	82.7	76.4	83.0	92.3	96.3

Source: Statistisches Bundesamt, *Wirtschaft und Statistik*, 5/82, p. 406.

Taking into account both improvements and increases in technical equipment within households, it seems likely that there would have been productivity growth in household production in line with that observed in the formal economy. In using time-inputs as an estimate of output, therefore, productivity growth has to

be taken into account. A method which incorporates the productivity growth in household production is discussed in part 4.2 of this paper. Before presenting estimates of the value of household production in the FRG, we discuss briefly methods of valuing time spent in housework.

3. METHODS OF ESTIMATION

All studies undertaken to estimate the value of household production on the macro level utilize time-input data because of the problems mentioned above. The valuation methods are basically of two types (see also Hawrylyshyn [10] and Goldschmidt-Clermont [9]): (a) the Opportunity Cost Method, and (b) the Market Cost Method.

(a) *Opportunity Cost Method*

This approach is based on the assumption of a rational individual who allocates his/her time by equating the marginal value of one hour worked in the formal economy to the marginal value of one hour worked in household production. If the individual (or the household) is allocating time rationally in this sense then the value of household production can be computed as follows:

$$VHP_j = W_j \cdot \sum_i T_i$$

with: VHP_j = value of household production for an individual, W_j = wage of an individual, and T_i = time spent in different household activities.

The value of household production for the whole economy would then be given by:

$$VHP \cdot = \sum_j VHP_j$$

Valuing time spent in household work by opportunity costs (i.e. individual wages) assumes that the individual allocates time rationally in the marginal sense. This method is questionable for two reasons. In the first place, constraints on working time (e.g. a 40 hour work week) may prevent the individual from realising the optimum equilibrium point of the trade-off. Secondly, it is not clear that individuals necessarily act rationally in the marginal sense. In any case, there is the further problem that some persons (e.g. housewives and pensioners) cannot easily be allocated an opportunity wage and, therefore, the Opportunity Cost Method cannot be applied.

In the case of certain specific household tasks like cleaning, the Opportunity Cost Method provides absurd results because the value of such tasks depends on the position of the worker within the income hierarchy. In other words, the value of this type of work cannot be taken necessarily as a positive function of the performer's relative wage. Valuing time spent in household production by opportunity costs which incorporate different wage-levels leads to reasonable results only if the wage differentials are correlated highly with productivity differentials. But there is no reason to expect that this is necessarily the case in many aspects of household production.

(b) *Market Cost Method*

There are two variants of the Market Cost Method: one involves the costs of a hired person undertaking all the household work and the other involves the costs of several persons hired for different specific tasks. The first approach introduces a major problem since there is virtually no labour market for persons to undertake all household tasks. The disadvantage of the second approach is that time-budgets have to be collected for individual household tasks. The second method is described by the formula:

$$VHP = \sum_i W_i \cdot T_i$$

with W_i = wage for a specific task, and T_i = time spent in a specific task.

This method seems to provide better results for the value of household production than the Opportunity Cost Method, but it leaves certain matters unresolved. First, it could be inadequate to set the productivity of persons in a given formal economy job to be equal to the productivity of persons undertaking the same job on an occasional basis within households. Besides this problem, there is a certain amount of time spent by householders in tasks which may give additional benefits in the form of positive psychic returns from performing particular tasks (this argument applies for the Opportunity Cost Method as well). So the measure of time spent on the job within households will probably overestimate the output. Another question is whether the wage in any case represents the full costs of hiring a person to undertake either the whole of the housework or individual tasks. In empirical studies mentioned in Part 5, the direct costs which have to be paid by the household are not imputed; rather, use is made of the wages of the persons potentially hired. But the wage does *not* represent the full labour cost since e.g. social insurance contributions of employers are excluded. Thus, a simple wage measure underestimates the value of household production. Therefore, using the Market Cost Method involves, at least, imputing the gross wages as well as the social security contributions of employers (see also Murphy [13]).

4. ESTIMATES OF THE VALUE OF HOUSEHOLD PRODUCTION

In order to estimate the value of household production the data mentioned in section 2 is used. Since it was only available in the published form, no disaggregation was possible. The time budgets relate to the whole population of the FRG over the age of 14 years. These data do not permit use of the Opportunity Cost Method or the Market Cost Method in their pure theoretical forms. Nevertheless, it is possible to use different wage rates which approximate the wages for the two methods.² The wage used in the Opportunity Cost Method is the average gross wage of blue-collar workers in industry. Blue-collar workers are the only employees for whom wages per hour are available for the estimation period (1964 to 1980) and the income of blue-collar workers is roughly representative of the average income in Germany. In the Market Cost Method, the average gross wages

²The only data which allowed for using individual wages was that used in the study of Murphy [13].

of women employed as blue-collar workers in industry are used because it can be assumed that these lower wages represent the potential wages paid for housework. Both methods were used, even though the Market Cost Method is favoured, in order to show the sensitivity of the results to the different underlying assumptions.

It should be added that there is a debate over whether gross or net wages should be used (see e.g. Hawrylyshyn [10]). It has been argued that the individual relates his/her time use decision to net wages rather than to gross wages. This might be true, especially in connection with the Opportunity Cost Method and its underlying assumptions. On the other hand, measuring the value of household production from a macro economic point of view, it is quite clear that taxes and social security expenditures are also part of the produced value. If this is accepted then the employer's contributions to social security have also to be imputed. In the FRG employers pay half of total social security contributions.

In order to examine the value of household production relative to that in the formal economy and to evaluate shifts between the two sectors, we use the ratio of household production to formal production. Most of the studies undertaken in other countries use GNP as the basis for this ratio. But since we are measuring household production only in terms of value added, the proper basis should be national income measured in factor costs. However, given that most other studies do work with GNP, the ratios were calculated for both GNP and national income.

As mentioned above, there is considerable evidence that household production has become more and more productive given the growth and improvement in technical equipment used in households. If this productivity growth is not taken into account, the measured decrease in time spent in housework would represent an underestimate of household output. However, if use is made of actual wages, then this partly allows for productivity growth since to some extent wage-increases are determined by productivity growth itself. Since the assumption that productivity growth in households is equivalent to that in the formal economy is perhaps a weak one, estimates were first calculated without explicitly allowing for productivity growth and then estimates were carried out which explicitly accommodate productivity growth. Not surprisingly, this produced divergent results.

4.1. Results

The decline in average hours spent in housework and shopping from 1964 to 1980 was accompanied by a decline in the volume of time spent on these activities in the whole economy. However, the latter took place at a lower rate and this is explained by population growth in this period; the overall household production volume is the product of average time spent in household work and population size. From the estimates arising from the different methods, the ranks of estimates are always as follows: gross including social security contributions of employers ($\cdot\cdot\cdot-G+$), gross ($\cdot\cdot\cdot-G$), net ($\cdot\cdot\cdot-N$). This is not surprising because it is a direct result of the methods' actual formulation.

TABLE 3
ESTIMATES OF HOUSEHOLD PRODUCTION IN THE FRG

	Absolute (in mill. hours and mill. DM)				Indices (1964=100)				Ratio to GNP				Indices of Ratios to GNP (1964=100)			
	1964	1970	1974	1980	1964	1970	1974	1980	1964	1970	1974	1980	1964	1970	1974	1980
<i>Volume</i>	50,429	50,137	46,389	46,319	100	99.4	92.0	91.9								
<i>Nominal Values</i>																
Opportunity Cost Method																
Gross (OCM—G)	195,664	306,337	423,537	621,144	100	156.5	216.4	317.4	46.6	45.3	42.9	41.8	100	97.2	92.1	89.7
Gross+(OCM—G+)	220,317	346,773	489,608	721,769	100	157.3	222.2	327.6	52.5	51.3	49.6	48.6	100	97.7	94.6	92.6
Net (OCM—N)	155,944	230,059	296,052	425,483	100	147.5	189.8	272.8	37.1	34.0	30.0	28.6	100	91.6	80.8	77.1
Market Cost Method																
Gross (MCM—G)	140,697	224,112	320,088	474,775	100	159.2	227.5	337.4	33.5	33.1	32.4	31.9	100	98.9	96.8	95.3
Gross+(MCM—G+)	158,424	253,694	370,021	551,688	100	160.1	233.5	348.2	37.7	37.5	37.5	37.1	100	99.4	99.4	98.4
Net (MCM—N)	112,135	168,308	223,741	325,220	100	150.0	199.5	290.0	26.7	24.9	22.7	21.9	100	93.2	84.9	81.9
GNP	419,600	675,700	985,600	1484,200	100	161.0	234.8	353.7								

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OCM—G = Opportunity Cost Method, gross wages.
 OCM—G+ = Opportunity Cost Method, gross wages plus social security contributions of employers.
 OCM—N = Opportunity Cost Method, net wages.
 MCM—G = Market Cost Method, gross wages.
 MCM—G+ = Market Cost Method, gross wages plus social security contributions of employers.
 MCM—N = Market Cost Method, net wages.

The Market Cost Method always yields the lowest estimate since lower wages are used in this case. The sizes of the estimates are clearly very different; the largest estimate (OCM—G+) is more than twice the size of the lowest estimate (MCM—N). More interesting than the absolute figures are the trend values of household production shown in the middle of Table 3. Without exception, all methods and wage categories display a positive trend. This result is explained by the rising wage rates more than compensating for decreases in volume. Comparing the indices of the Opportunity Cost Method and the Market Cost Method within the same wage category, the Market Cost Method always provides higher values. This is explained by the more than proportionate increase of lower wages relative to higher wages.

There is an overall decline in the ratios of household production to GNP in nominal terms (see Table 3, right side) but at different rates, depending on the method adopted and the wage category. The decline is lowest where wages plus social security payments (OCM—G+ or MCM—G+) are used and highest where net wages (OCM—N or MCM—N) are used. This can easily be explained by the increases in social security contributions and tax rates which are fully counted in GNP but excluded from informal production, thereby underestimating the wage component. The ratios estimated by the Market Cost Method including social security contributions of employers produce an almost stable ratio of household production to GNP. This can be explained by rising social security contributions as mentioned above and by the relative rise of lower incomes compared with average income, a factor which also explains the difference in the rate of decline between “MCM—G+” and “OCM—G+” (see Table 3).

TABLE 4
RATIO OF HOUSEHOLD PRODUCTION TO NATIONAL INCOME

	Ratio to National Income				Indices of Ratios (1964=100)			
	1964	1970	1974	1980	1964	1970	1974	1980
Opportunity Cost Method								
Gross (OCM—G)	59.7	57.7	54.7	54.1	100	96.5	91.6	90.5
Gross+ (OCM—G+)	67.3	65.3	63.3	62.8	100	97.1	94.0	93.4
Net (OCM—N)	47.6	43.4	38.3	37.0	100	91.0	80.3	77.8
Market Cost Method								
Gross (MCM—G)	42.9	42.2	41.4	41.3	100	98.2	96.3	96.2
Gross+ (MCM—G+)	48.4	47.8	47.8	48.0	100	98.8	98.9	99.2
Net (MCM—N)	34.2	31.7	28.9	28.3	100	92.6	84.4	82.7

OCM—G = Opportunity Cost Method, gross wages.

OCM—G+ = Opportunity Cost Method, gross wages plus social security contributions of employers.

OCM—N = Opportunity Cost Method, net wages.

MCM—G = Market Cost Method, gross wages.

MCM—G+ = Market Cost Method, gross wages plus social security contributions of employers.

MCM—N = Market Cost Method, net wages.

Since national income is by definition lower than GNP, the ratio of household production to national income is higher than the ratio to GNP (see Table 4). But the trends in these ratios are roughly the same. So, for comparison of trends, it makes little difference whether GNP or national income is chosen as a base.

4.2. Results after Correcting for Productivity Growth

Changes in nominal GNP or national income are influenced by price rises and by growth of output. Eliminating price rises by deflating the nominal values by a GNP price deflator provides an estimate of the real output changes. Real output changes are the result of the interaction of two factors, productivity changes and input changes. Although the inputs in the FRG, measured in working-time volume, have declined over the past decades, GNP in real terms has risen. Therefore, productivity growth has more than offset the decrease in inputs in the formal economy.

As mentioned earlier, there is considerable evidence that time spent in household production has become increasingly efficient due to more and better technical equipment in households. Because there is no way of measuring the real output of household production, there is no direct means of calculating the real productivity growth in this sector. One way of taking household productivity increases explicitly into account is to estimate them with reference to productivity growth in the formal economy. But, again, there is the question whether productivity growth in the formal economy provides an adequate estimate because different productivity changes have taken place in the different sectors of the formal economy (see Baumol [2] and Skolka [16]). The productivity growth of the service sector would probably underestimate household productivity growth because much of the work undertaken in households can be rationalised with technical equipment. On the other hand, if one took the sector with the largest productivity growth one would overestimate household productivity growth since here the work is highly differentiated for special tasks, the work organisation is highly developed and workers are fairly well trained.

One solution, although perhaps retaining limitations, is to take the overall productivity rise as reflected by GNP per effective working hour. Such a productivity index is shown in Table 5. If the productivity figures in Table 5 can be

TABLE 5
PRODUCTIVITY AND REAL WAGE INCREASES (1964=100)

Year	Productivity ¹	Real Wage ²	Difference
1964	100.0	100.0	0
1970	135.7	134.4	-1.3
1974	161.7	157.6	-4.1
1980	199.3	178.9	-20.4

¹Output per hour worked.

²Average wages of workers in industry deflated by consumer price index.

Source: Author's calculations on basis of IFO data and official statistics.

taken to represent the development in household production, then one hour spent in housework in 1980 was twice as productive as in 1964. Of course, it could well be that the figures in Table 5 do not represent the correct level of productivity growth in household production. But, taking into account the rise and improvement of technical equipment in households, it can at least be taken as a rough estimate.

The index of the real wages in Table 5 demonstrates that valuing working-time volume in household production by wages allows for some productivity growth as well. But productivity growth is only implicitly taken into account, and if the productivity growth of the whole economy is representative of the productivity growth in household production, the development of output will be underestimated. Comparing the indices of real wage growth and productivity growth, it is clear from Table 5 that in the seventies the gap between wage increases and productivity increases has been growing.

Given the assumption that productivity growth in the formal economy was the same as in household economy, the figures in Table 4 underestimate the output growth of household production and also its ratio to GNP or national income. This occurs because we counted only that part of productivity growth which is represented by wage increases. Now we want to correct for this by eliminating wage increases and substituting productivity increases.

TABLE 6
HOUSEHOLD PRODUCTION AFTER CORRECTING FOR PRODUCTIVITY GROWTH

	Absolute Values in Real Terms (100 in mill DM)				Ratio to GNP			
	1964	1970	1974	1980	1964	1970	1974	1980
Opportunity Cost Method								
Gross (OCM—G)	195,665	263,979	291,043	358,177	46.6	48.6	47.4	49.9
Gross + (OCM—G+)	220,318	297,241	327,714	403,308	52.5	54.7	53.4	56.2
Net (OCM—N)	155,945	210,392	231,961	285,467	37.2	38.7	37.8	39.8
Market Cost Method								
Gross (MCM—G)	140,697	189,820	209,281	257,555	33.5	34.9	34.1	35.9
Gross + (MCM—G+)	158,425	213,738	235,650	290,007	37.8	39.3	38.4	40.4
Net (MCM—N)	112,135	151,287	166,797	205,272	26.7	27.8	27.2	28.6
Indices of Ratio to GNP (1964=100)					100.0	104.3	101.7	107.1
GNP	419,600	543,360	613,970*	718,100				

- OCM—G = Opportunity Cost Method, gross wages.
- OCM—G+ = Opportunity Cost Method, gross wages plus social security contributions of employers.
- OCM—N = Opportunity Cost Method, net wages.
- MCM—G = Market Cost Method, gross wages.
- MCM—G+ = Market Cost Method, gross wages plus social security contributions of employers.
- MCM—N = Market Cost Method, net wages.

The results in real terms are shown in Table 6. Since the development of household production is now determined by working-time volume and productivity growth, the level and the ratio of GNP or national income is influenced by the wage category chosen in the base year. But the wage categories do not have any effect on the indices. The indices of the ratios to GNP and national income shown in Table 6 reveal different trends from those in Table 3. Whereas before we obtained a clear downward trend, we now obtain an increasing trend.

TABLE 7
COMPARISON OF RATIO ESTIMATES FOR U.S.A., CANADA AND FRG
(ratio to GNP)

Author	Method	Wage	Years												
			1958	1960	1961	1964	1965	1966	1970	1971	1973	1974	1976	1980	
Nordhaus/Tobin (1972) (U.S.A.)	OCM	gross	53.5				47.0								
Weinrobe (1974) (U.S.A.)	OCM	gross		34.1	33.5	31.6	30.5	28.7	31.1						
Murphy (1978) (U.S.A.)	OCM	net		37.6						37.1					
	MCM	gross		36.8						34.3					
Murphy (1982) (U.S.A.)	OCM	net												50.7	
	MCM	gross												44.1	
Kendrick (1979) (U.S.A.)	MCM	gross						23.9				24.4			
Adler/Hawrylyshyn (1978) (Canada)	OCM	net			43.6							40.0			
	MCM				39.5							41.1			
Schettkat (1983) (FRG)	OCM	gross				46.6				45.3			42.9		41.8
		gross (prod.)				46.6				48.6			47.4		49.9
	MCM	gross				33.5				33.1			32.4		31.9
		gross (prod.)				33.5				34.9			34.1		35.9

OCM = Opportunity Cost Method

MCM = Market Cost Method

net = net wages

gross = gross wages

prod. = with productivity increase explicitly taken into account.

Source: See references.

5. COMPARISON WITH ESTIMATES FOR OTHER COUNTRIES

Other attempts at estimating household production, expressed as a ratio to GNP, reveal a large variety of results ranging from 23.9 percent in Kendrick's [11] study to 53.3 percent in the study of Nordhaus/Tobin [14]. Much of the variation can be explained by the construction of the housework volume used to derive the estimates; there are differences in time-budgets and in the population size taken into account. Another reason for the divergent results is the measure of wages adopted; some studies use average wages, others use median wages and yet others women's wages. The results are also dependent on whether net or gross wages are used (for more details see Schettkat [15]). The only study using gross wages plus employers' social security contributions is undertaken by Murphy [12/13]. He obtains higher estimates than the other studies.

All these studies use time-budget data collected in one year and hold the amount of time spent in housework constant for certain demographic categories over time. Thus they do not take into account changing time-use patterns, and so variations in estimates through time are related only to changes in the socio-demographic structure of society and wage growth. Not one of these studies takes productivity growth in household production resulting from the increasing use of technical equipment explicitly into account. This can change results, especially in trends of variables, as shown above.

All studies show a decreasing trend in the ratio of household production to GNP except for the estimates of Adler/Hawrylyshyn [1] who use the Market Cost Method. This generally observed trend would also be found in Germany if productivity growth were not explicitly taken into account. Allowing for the growth in productivity yields results for the FRG that exhibit a slightly increasing ratio of household production to GNP.

It should be emphasised that the Market Cost Method would appear to be the better approach for estimating the output of household production. However, if this method is used social security contributions of employers must be added to gross wages because such contributions would also have to be paid if household labour were hired.

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