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Households' Unpaid Work: Measurement and Valuation

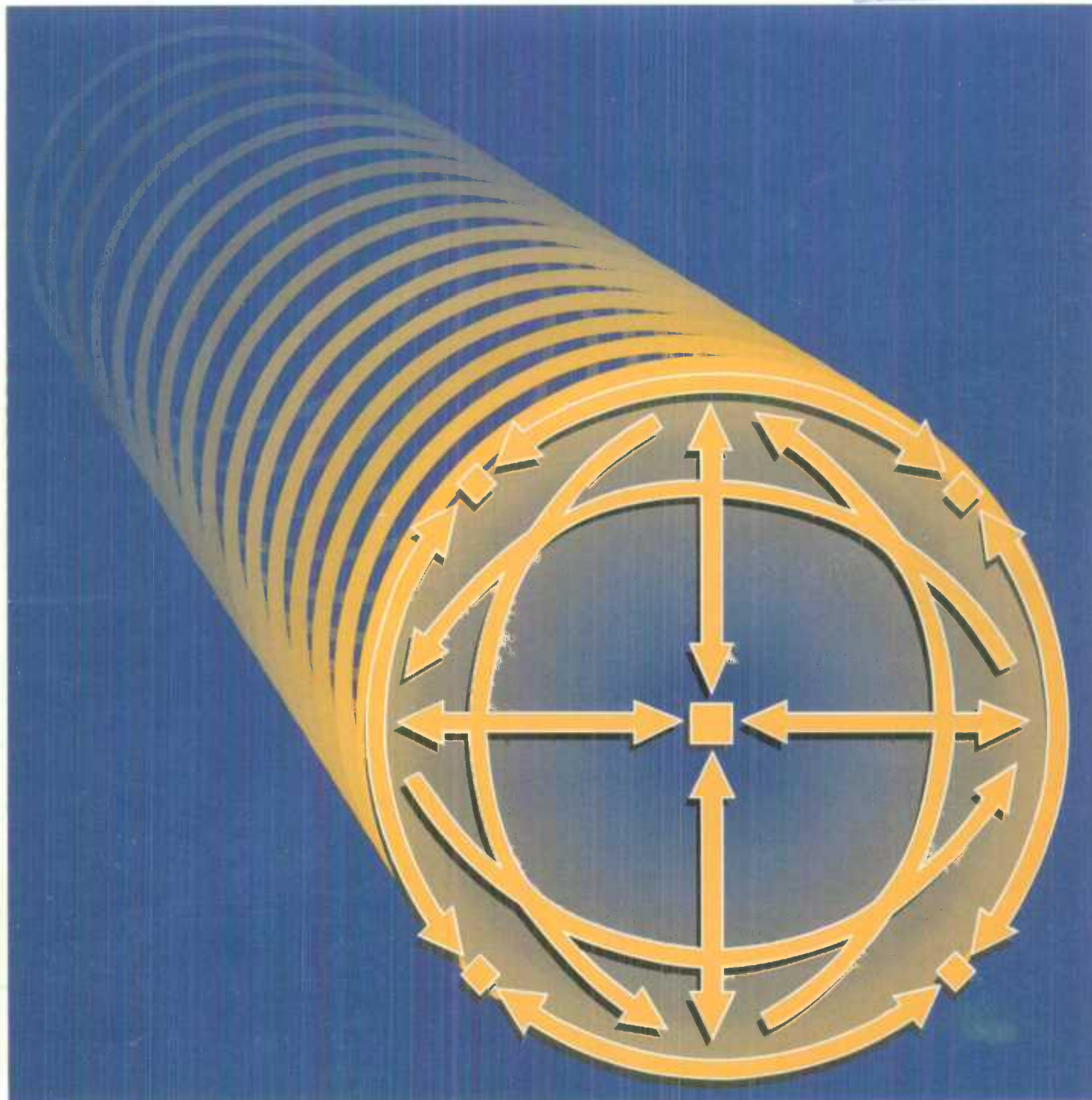
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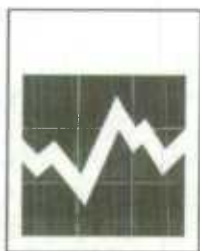
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Households' Unpaid Work: Measurement and Valuation

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The System of National Accounts

In Canada, the National Accounts have been developed since the close of the Second World War in a series of publications relating to their constituent parts. These have now reached a stage of evolution where they can be termed a "System of National Accounts". For purposes of identification, all publications (containing tables of statistics, descriptions of conceptual frameworks and descriptions of sources and methods) which make up this System carry the term "System of National Accounts" as a general title.

The System of National Accounts in Canada consists of several parts. The annual and quarterly Income and Expenditure Accounts (included with Catalogue Nos. carrying the prefix 13) were, historically speaking, the first set of statistics to be referred to with the title "National Accounts" (National Accounts, Income and Expenditure). The Balance of International Payments data (Catalogue Nos. with prefix 67) are also part of the System of National Accounts and they, in fact, pre-date the Income and Expenditure Accounts.

Greatly expanded structural detail on industries and on goods and services is portrayed in the Input-Output Tables of the System (Catalogue Nos. with prefix 15). The Catalogue Nos. carrying the prefix 15 also provide measures of the contribution of each industry to total Gross Domestic Product at factor cost as well as Productivity Measures.

Both the Input-Output tables and the estimates of Gross Domestic Product by Industry use the establishment as the primary unit of industrial production. Measures of financial transactions are provided by the Financial Flow Accounts (Catalogue Nos. with prefix 13). Types of lenders and financial instruments are the primary detail in these statistics and the legal entity is the main unit of classification of transactors. Balance sheets of outstanding assets and liabilities are published annually.

The System of National Accounts provides an overall conceptually integrated framework in which the various parts can be considered as interrelated sub-systems. At present, direct comparisons amongst those parts which use the establishment as the basic unit and those which use the legal entity can be carried out only at highly aggregated levels of data. However, Statistics Canada is continuing research on enterprise-company-establishment relationships; it may eventually be feasible to reclassify the data which are on one basis (say the establishment basis) to correspond to the units employed on another (the company or the enterprise basis).

In its broad outline, the Canadian System of National Accounts bears a close relationship to the international standard as described in the United Nations publication: A System of National Accounts (Studies in Methods, Series F, No. 2 Rev. 3, Statistical Office, Department of Economic and Social Affairs, United Nations, New York, 1968).

List of abbreviations

CPP	Canada Pension Plan
EUROSTAT	Statistical Office of the European Communities
GDP	Gross Domestic Product
GNP	Gross National Product
GSS	General Social Survey
ILO	International Labour Organisation
INSTRAW	International Research and Training Institute for the Advancement of Women
n.a.	not available or not applicable
n.e.c.	not elsewhere classified
OC-AT	Opportunity cost after tax
OC-ATE	Opportunity cost after tax and work-related expenses
OC-BT	Opportunity cost before tax
OECD	Organisation for Economic Co-operation and Development
QPP	Quebec Pension Plan
RC-G	Replacement cost (generalist)
RC-S	Replacement cost (specialist)
SNA	System of National Accounts
UI	Unemployment Insurance
VHW	Value of Household Work
VUW	Value of Unpaid Work

Symbols

The following standard symbols are used in Statistics Canada publications:

..	figures not available
...	figures not appropriate or not applicable
—	nil or zero
--	amount too small to be expressed
p	preliminary figures
r	revised figures
x	confidential to meet secrecy requirements of the Statistics Act

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Requests

Inquiries can be addressed to the information officer, National Accounts and Environment Division, at 613-951-3640.

Note

The tables and analysis presented in this report were prepared from May 1994 to November 1995 and do not reflect any statistical revisions carried out after June 1995.

Table of Contents

1 Introduction	1	3 Sources and methods	29
1.1 Motivation for the study	1	3.1 Overview	29
Measuring economic activity	2	Coverage of population and activities	29
Other uses	2	Valuation methods	29
1.2 Unpaid work and national accounts	2	Data sources	30
Background	3	Estimation formulas and statistics	30
The definition of production	4	3.2 Population counts	31
Why exclude unpaid work from GDP?	4	Data sources and procedures	31
1.3 Scope and objectives	5	Population coverage	31
Scope	5	Population groups	32
Objectives	6	3.3 Time use	33
1.4 Summary findings	6	Data sources	33
Time spent on unpaid work	6	Procedures	33
Monetary value of unpaid work	7	Classification of unpaid work	34
Unpaid work and economic growth	7	Imputation of unpaid work	36
Unpaid work in the past, present and future	8	3.4 Valuation	36
1.5 Unpaid work in the broader context	8	Data sources and procedures	36
Demographics	9	Opportunity cost	37
Dwellings and technology	9	Replacement cost	37
Labour market participation and income	10	3.5 Differences with past studies	38
Spending on goods and services	10	4 Results	41
1.6 Outline of the report	11	4.1 Summary results	42
2 Concepts, definitions and measurement	13	Valuation methods compared	42
2.1 Concepts	13	Comparison between household and	
Activities and time use	13	market sectors	42
Productive activity	14	Regional variation in unpaid work	44
Market activity	15	Women's contribution	44
Economic value	15	Economic growth	45
Households as producers	16	4.2 Underlying trends	46
2.2 Definitions of unpaid work	17	Composition of the population	46
Selected definitions	17	Time spent on unpaid work	47
The third person criterion	18	Opportunity and replacement costs	49
Other criteria	19	4.3 Sensitivity tests	50
2.3 General measurement approaches	20	Sensitivity to time use data	50
Volume of inputs	20	Sensitivity to imputed costs	51
Volume of outputs	20	Summary	53
Value of time inputs	21	5 International comparisons	55
Value of outputs	21	5.1 Population coverage	55
2.4 Measuring time spent on unpaid work	22	5.2 Definitions and source data	56
Time use surveys	22	Definitions	56
Direct and diary approaches	22	Data on time use	56
2.5 Valuing unpaid work	23	5.3 Valuation methods	57
Opportunity cost	24	Opportunity cost	57
Replacement cost	25	Replacement cost	57
Relevance of imputed values	26	5.4 Results	60
Adjustments to wages	26	6 Conclusion	63
General criticisms	27	Appendix Tables	65
The choice of method	28	Bibliography	96

List of Tables

Table 1.1	Value of Unpaid Work Relative to Gross Domestic Product	7	Table 4.17	Sensitivity to the Imputation of Time Spent on Unpaid Work, 1961 and 1971	51
Table 2.1	Definitions of Household Work and Production	17	Table 4.18	Sensitivity to the Adjustment for Social Security	52
Table 2.2	Measurement Methods	20	Table 4.19	Sensitivity to the Female-Male Earnings Gap	52
Table 3.1	Classification of Population Groups.....	32	Table 4.20	Sensitivity to the Tax Rate	52
Table 3.2	Classification of Unpaid Work.....	35	Table 4.21	Sensitivity to the Choice of Occupation	53
Table 3.3	Occupations Matched to Unpaid Work.....	39	Table 5.1	Comparison of National Studies	58
Table 4.1	Value of Unpaid Work by Method	42	Table A.1	Population by Demographic Group	66
Table 4.2	Ratios of VUW to Selected Aggregates	42	Table A.2	Average Hours of Unpaid Work by Demographic Group.....	67
Table 4.3	Hours of Unpaid Work	43	Table A.3	Concordance Between Activity Classifications	68
Table 4.4	Selected Ratios of Spending to the Value of Unpaid Work at Replacement Cost (Specialist)	43	Table A.4	Imputed Costs by Method, Canada, Provinces and Territories	70
Table 4.5	Ratio of VUW to GDP by Region	44	Table B.1	Hours of Unpaid Work, Canada, Provinces and Territories	72
Table 4.6	Unpaid Work of Women	44	Table B.2	Unpaid Work at Opportunity Cost Before Tax, Canada, Provinces and Territories	73
Table 4.7	Average Value of Unpaid Work of Women, at Replacement Cost	45	Table B.3	Unpaid Work at Opportunity Cost After Tax, Canada, Provinces and Territories	74
Table 4.8	GDP and Value of Unpaid Work.....	46	Table B.4	Unpaid Work at Replacement Cost (Specialist), Canada, Provinces and Territories	75
Table 4.9	Annual Growth of GDP plus VUW ...	46	Table B.5	Unpaid Work at Replacement Cost (Generalist), Canada, Provinces and Territories	76
Table 4.10	Composition of the Population.....	47	Table C.1	Hours of Unpaid Work by Activity	77
Table 4.11	Hours of Unpaid Work per Person...	48	Table C.2	Unpaid Work at Opportunity Cost Before Tax by Activity	80
Table 4.12	Composition of Time Spent on Unpaid Work.....	48			
Table 4.13	Women's Share of Time Spent on Unpaid Work.....	49			
Table 4.14	Imputed Opportunity Cost.....	49			
Table 4.15	Imputed Replacement Cost	50			
Table 4.16	Sensitivity to the Data on Unpaid Work	51			

Table C.3	Unpaid Work at Opportunity Cost After Tax by Activity	83
Table C.4	Unpaid Work at Replacement Cost (Specialist) by Activity	86
Table C.5	Unpaid Work at Replacement Cost (Generalist) by Activity	89
Table D.1	Sensitivity Tests on the Imputation of Time Spent on Unpaid Work, 1961 and 1971	92
Table D.2	Sensitivity Tests on the Imputation of Opportunity Cost	93
Table D.3	Sensitivity Tests on the Imputation of Replacement Cost	94

1 Introduction

In the foreword to Statistics Canada's first report on the value of household work, Peter Kirkham, then Chief Statistician of Canada, wrote: "Statistics Canada hopes that this paper will provide a useful focus for dialogue on the desirability and viability of undertaking such estimates. We therefore invite comments on the paper in the expectation that such comments will contribute to a clarification of the non-market measurement issue."¹ Fifteen years later, in April 1993, Statistics Canada and Status of Women Canada co-sponsored the **Conference on the Measurement and Valuation of Unpaid Work**. The conference had roughly the same goals as the report, but by then the desirability and viability of such estimates were no longer at issue.²

This report is intended to take stock of the research and development at Statistics Canada to date and presents revised estimates of the value of unpaid work (VUW) for the period from 1961 to 1992. It addresses some key questions. Why measure and value unpaid work and why exclude it from GDP? What counts as unpaid work, whose work counts, and how is it valued? What is the value of unpaid work in Canada and how has it changed over time? What are its relationships with other socio-economic factors? The remainder of the introduction addresses these issues in general terms.

Statistics Canada's efforts to measure and value unpaid work date back to the early seventies, originating with a review of the measurement of Gross National Product (GNP).³ Following this review, Statistics Canada initiated a study to develop ways to estimate the value of household work (VHW). After extensive research, the study reported on three ways to estimate VHW and gave some estimates for 1971. As Oli Hawrylyshyn, author of the study, pointed out: "arriving at a set of numbers was not the primary

objective of this research; rather, it was to investigate how this can be done in practice, considering all the procedures required and the concomitant pitfalls that one must struggle with in the estimations."⁴ Many subsequent studies have been based on Hawrylyshyn's approach.

A key requirement for estimating the value of unpaid work is knowledge of how people spend their time. The first study relied upon limited information from surveys in Halifax and Toronto in 1971 and 1972. More broadly-based time use surveys have been carried out since then. The first national survey was conducted in 1981. Subsequently, the time use survey was established as a regular component of the **General Social Survey (GSS)**. These surveys have enabled Statistics Canada to update its VHW estimates.⁵ Additional sources of information on time use are being developed. For instance, questions on how much time is spent on unpaid housework and child and elder care will be asked on the 1996 census.

1.1 Motivation for the study

Why measure and value unpaid work? There are some very basic reasons. In Canada and elsewhere, people spend roughly as much time on unpaid work as they do at their paid jobs.⁶ And regardless of how this unpaid work is valued, it represents a major use of resources with substantial costs and benefits to

1. Foreword to Hawrylyshyn, *Estimating the Value of Household Work in Canada, 1971*, 1978.
2. The conference brought together experts in the field as well as representatives from various government departments, statistical agencies, universities, associations and interest groups from Canada and abroad, with a view to sharing information, expertise and different perspectives on the subject. See *International Conference on the Measurement and Valuation of Unpaid Work: Proceedings*, 1994.
3. Oli Hawrylyshyn, *A Review of Recent Proposals for Modifying and Extending the Measure of GNP*, 1974.

4. Preface to *Estimating the Value of Household Work in Canada, 1971*. Hawrylyshyn authored several related articles. See "The Value of Household Services: A Survey of Empirical Estimates," *Review of Income and Wealth*, 1976; "Towards a Definition of Non-Market Activities," *ibid.*, 1977; "The Economic Nature and Value of Volunteer Activity in Canada," *Social Indicators Research*, 1978; and with Adler, "Estimates of the Value of Household Work in Canada, 1961 and 1971," *Review of Income and Wealth*, 1978.
5. See Swinamer, "The Value of Household Work in Canada, 1981," *Canadian Statistical Review*, 1985; Jackson, "The Value of Household Work in Canada, 1986," *National Income and Expenditure Accounts*, First Quarter 1992; and Chandler, "The Value of Household Work in Canada, 1992," *ibid.*, Fourth Quarter 1993. See also Thoen, "The Value of Household Production in Canada, 1981 and 1986," 1993; Jackson, "Trends in the Value of Household Work in Canada, 1961-1986," 1993; and Chandler, Gray and Jackson, "The Boundaries of Economic Activity: An Application of 1993 SNA Principles," 1995.
6. See Ironmonger, "National Time Accounts and Accounts for the Household Economy," in Kalfs and Harvey, eds., *Fifteenth Reunion of the International Association for Time Use Research*, 1994.

individuals, households and society at large. Who bears the burden and who receives the benefits of unpaid work are important issues as well.

1.1.1 Measuring economic activity

There are some long-standing arguments in national accounting for including households' unpaid work in measures of economic activity. One argument is that whenever production shifts over time from the non-market to the market sector of the economy, there is an upward bias in measured growth rates as a result.⁷ The steady increase in women's participation in the labour market over the last thirty years, for example, has led to an overstatement of economic growth.

A related argument rests on the premise that unpaid work is counter-cyclical.⁸ In other words, when the market economy is growing rapidly, activity in the non-market sector grows more slowly or declines and *vice versa*. The market sector draws resources from the non-market sector in periods of expansion and releases them in periods of decline. As a result, measured economic growth rates, which essentially track the course of the market economy, will tend to exaggerate the magnitude of economic cycles. The results from this study lend some support to this argument.

Finally, taking account of the value of households' unpaid work would make international comparisons more meaningful.⁹ The degree to which economic activity is channelled through the market varies in every country, depending on institutional rules, social norms and customs and on the level of economic

development. As a result, comparisons of measures of market activity alone can be somewhat misleading.

1.1.2 Other uses

Information on unpaid work and its associated costs and benefits has potentially wide-ranging uses. Among other things, it can serve: 1) to monitor and describe more completely how resources are used; 2) to foster a greater understanding of the economy and of the links between its market and non-market sectors; 3) to provide information on what types of work are undertaken, what goods and services result, what costs are incurred, who provides and who benefits; and 4) to inform public debate and help in the formulation of public policy. Perhaps even more important, it lends tacit recognition to the unpaid but beneficial tasks that Canadians do for themselves, their family and friends, and for the community at large.

Alongside the debate among practitioners on the measurement and valuation of unpaid work, there is a public debate on unpaid work itself on which statistical information is shedding some light.¹⁰ The questions arise as to whether housework should be paid and subject to tax, whether households should be covered by occupational health and safety regulations and workers' compensation legislation, whether homemakers should contribute to, and benefit from, the Canada Pension Plan, and so on. Canadian courts are also confronted with the issue of assessing the value of unpaid work, for instance, in cases of negligence causing injury or death, and in divorce settlements.

1.2 Unpaid work and national accounts

Why is the unpaid work of households excluded from Gross Domestic Product? Despite some demands to

7. See, for example, Lindahl, *et al.*, *National Income of Sweden, 1861-1930*, 1937, p. 527, and Mitchell, *et al.*, *Income in the United States: Its Amount and Distribution, 1909-1919*, 1921, p. 58. Some approximations place this bias for Canada at about 0.5 percentage points a year over the periods 1971 to 1981 and 1981 to 1986. See Clift and Wells, "The Reliability of the Canadian National Accounts Estimates," *Canadian Economic Observer*, 1990 and Jackson, "The Value of Household Work in Canada, 1986."

8. See Benhabib, *et al.*, "Homework in Macroeconomics: Household Production and Aggregate Fluctuations," *Journal of Political Economy*, 1991, and Ironmonger, "National Time Accounts: A Focus for International Comparison, Modelling and Methodology," in Istituto Nazionale di Statistica, *Time Use Methodology: Toward Consensus*, 1993.

9. See, for example, Kravis, "The Scope of Economic Activity in International Income Comparisons," in *Problems in the International Comparison of Economic Accounts*, 1957.

10. See, for example, "How the mother half works," *Globe and Mail*, 7 July 1990, p. D1; "Valuing housework," *Ottawa Citizen*, 10 July 1992, p. A-10; "Mother is worth \$7.50 an hour, expert testifies," *Toronto Star*, 2 February 1984, p. A3; "Household work gets top court nod," *Globe and Mail*, 26 March 1993, p. A1; and Cassels and Philipps, "Why Lawyers Need Statistics on Unpaid Work," in *International Conference on the Measurement and Valuation of Unpaid Work*, 1994.

the contrary, the latest national accounts guidelines recommend continuing to exclude households' unpaid work from GDP.¹¹ This section summarizes some of the arguments in support of this position. It should be emphasized that the arguments are not against measuring and valuing unpaid work but rather aimed at maintaining a distinction between measures of households' unpaid work and market production.

The fact that unpaid work is not counted in GDP in no way precludes accounting for it or developing measures of non-market production, which could be compared or even combined with GDP. Indeed, the *SNA 1993* suggests the development of alternative measures of production, including unpaid work, within a separate accounting framework.¹² This is the route Statistics Canada favours and has been taking for some time now.

1.2.1 Background

The debate on whether unremunerated household services should be included in the national income has a long history, pre-dating modern national accounts. Adam Smith considered all services to be unproductive, although economists subsequently rejected this view.¹³ According to Hershlag, by the early part of this century, most agreed that it was inappropriate or misleading, but nonetheless a practical necessity, to leave out of economic calculations the substantial efforts of a considerable proportion of the population.¹⁴ Alfred Marshall felt that in a limited number of instances, income-in-kind, such as the own consumption of agricultural products by farmers, should be imputed in national income.

Cecil Pigou, who believed that household work was productive, but ultimately favoured its exclusion from national income, stated the well-known paradox: "...the services rendered by women enter into the dividend when they are rendered in exchange for wages, whether in factory or in the home, but do not enter into it when they are rendered by mothers and wives

gratuitously to their own families. Thus, if a man marries his housekeeper or his cook, the national dividend is diminished..."¹⁵

Simon Kuznets, a pioneer and early critic of modern national accounts, seems to have favoured the inclusion of unpaid work in national income: "...it may be doubted that the productive activities of housewives and other family members, rendered within the family circle, can be characterised as economic processes... The conditions under which they are carried on and the factors that affect the amount of income from them are so vastly different from those that bear upon activities whose products appear on the market place that it seems best to exclude them. But it cannot be denied that they are an important complement to the market-eventuating process in supplying goods to ultimate consumers, and should be considered in any attempt to evaluate the net product of the social system in terms of satisfying wants with scarce means..."¹⁶

The debate has been rekindled in recent years with calls for the inclusion of unpaid work in GDP.¹⁷ Since women do most of the unpaid household and volunteer work, their significant contribution to overall production and economic welfare is grossly understated in the major economic aggregates. A United Nations report on the Decade for Women for instance states: "the remunerated and, in particular, the unremunerated contributions of women to all aspects and sectors of development should be recognized, and appropriate efforts made to measure and reflect these contributions in national accounts and economic statistics and in the gross national product. Concrete steps should be taken to quantify the unremunerated contribution of women to agriculture, food production, reproduction and household activities."¹⁸

A similar recommendation was made at the recent World Summit on Social Development in Copenhagen: "Efforts are needed to acknowledge the social and economic importance and value of unremunerated work... and to accord social recognition for such work, including by developing methods for reflecting its value... in accounts that may be produced separately from, but consistent with, core national

11. Inter-Secretariat Working Group on National Accounts, *System of National Accounts 1993* (henceforth abbreviated as *SNA 1993*), para. 6.19-6.22.

12. *Ibid.*, Annex I, para. 35.

13. The view that services are unproductive survives even today and underlies the Material Product System of accounting used until recently in many centrally planned economies.

14. "The Case of Unpaid Domestic Services," *Economia Internazionale*, 1960, p. 26.

15. *The Economics of Welfare*, 1946, p. 33.

16. Simon Kuznets, *National Income and its Composition, 1919-1938*, 1941, p. 431.

17. See Waring, *If Women Counted*, 1988, and *Counting for Nothing*, 1992, and Steinem, *Moving Beyond Words*, 1994.

18. *The Nairobi Forward-Looking Strategies for the Advancement of Women*, 1985, para. 120.

accounts.”¹⁹ Similar recommendations can be found in the draft Platform for Action adopted at the United Nations Fourth World Conference on Women held in Beijing in September 1995.

1.2.2 The definition of production

Although no one would argue that money is the sole measuring rod of value, some would argue that what is not counted as economic production often ends up being invisible, unimportant and deemed of little or no value. Why not, then, simply make an imputation for the value of unpaid work and include it in GDP, as is done for own-account housing services (i.e., the implicit rent homeowners, as tenants, pay to themselves as landlords)?²⁰ Before one can debate the merits of the issue however, it is necessary to understand what constitutes production in an economic sense.

Generally, production is the activity carried out by an economic unit using inputs of capital, labour as well as goods and services to produce outputs. The definition of economic production in the national accounts is somewhat narrower. It only includes an output which can be delivered (i.e., a good) or provided (i.e., a service) to another economic unit or used up by the producer in a subsequent production process, leaving out entirely the services produced by households for own consumption as well as volunteer work. Specifically, the activities falling under the definition of production in the System of National Accounts are the following:

1) “the production of all individual or collective goods and services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods and services used up in the process of producing such goods or services; 2) the own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation; 3) the own-account production of housing services by owner-occupiers and of domestic and personal services produced by employing paid domestic staff.”²¹

19. United Nations, *Report of the World Summit for Social Development*, 1995, para. 46.

20. Imputations currently amount to about 6% of GDP, considerably less than what would result from an imputation for unpaid work. See *National Income and Expenditure Accounts*, Cat. No. 13-201, Table 54.

21. *SNA 1993*, para. 6.18.

By and large, GDP, the standard macro-economic aggregate, is defined as the value of market production. Any work performed outside the market is excluded from GDP. However, unpaid work by family members in support of a family business, as is common in agriculture for instance, is considered a market activity and thus valued in GDP.

The extension of this definition to the non-market production of households would have far-reaching implications. For instance, it would have repercussions on the measurement of various concepts of income and income distribution. If unpaid work were counted in GDP, it would also be counted in personal income. Since there is typically less paid work and more unpaid work in depressed countries or regions, including the value of unpaid work in personal income would make the poorer ones seem more prosperous. In Canada, regional disparities would seem smaller and the justification for equalization payments could be weakened.

The concepts of labour force, employment and unemployment would also need to be reconsidered. If household production were part of measured economic production, everyone not working in an office or factory would be considered employed at home and unemployment would virtually disappear from the statistics.²² And if households' unpaid work is in part counter-cyclical, its inclusion in GDP would make recessions seem less severe, a downturn in the market economy being offset by an increase in household production. Unpaid work could be made more visible, important and valuable in the eyes of individuals, households and society. Eventually, this could even lead to it being subsidized or taxed in some form.

One can debate the merits of alternative definitions of production and the potential implications. In the meantime, however, research on the measurement and valuation of households' unpaid work is continuing, albeit within a separate set of accounts.

1.2.3 Why exclude unpaid work from GDP?

Since there is already an imputation in GDP for housing services produced by owner-occupiers, which are not intrinsically different from unpaid

22. *Ibid.*

household services, there is an argument for also including the latter in GDP. The rationale for imputing non-market housing services is to avoid distortions of GDP when there are changes in the extent of home ownership. However, it can be argued that a similar distortion arises whenever services start being provided by the market instead of the household.²³ And that unpaid household services should be included in GDP, if only for the sake of consistency. Nonetheless, the services produced by household members for their own consumption and by volunteer workers for the community are left out of GDP for several reasons:

a) Currently, there is no firm agreement on the concept, definition, measurement and valuation of households' unpaid work. And generally a consensus must be reached on an issue before it can be the subject of international guidelines and standards.²⁴ Moreover, the majority of countries must be in a position to implement recommendations, if only for the sake of maintaining international comparability in practice.

b) Estimates of GDP are typically prepared on a regular basis (e.g., quarterly, annually) and most of the data used in their calculation are based on market transactions. At present, in most countries, there is no similar data base to draw upon to calculate estimates for unpaid work. Households do not keep records of their unpaid work in the same way that businesses keep track of their production, inventory, sales, revenues, expenditures, and so on. A huge effort would be required to establish data sources from which to derive regular and reliable estimates.

c) The introduction of significant changes in the System of National Accounts, such as the incorporation of unpaid work, ideally requires that all statistical series affected by the change be revised backward in time in order to maintain continuity of the series for comparison and analysis. Historical data on time spent on unpaid work, however, are woefully inadequate and for many countries non-existent. And while they may be estimated, they could not be deemed as reliable as the main national accounts aggregates.

d) Because household services are not produced for the market, there is no market price to value them and, consequently, their value must be imputed. The

need to impute value in the national accounts is not new. Indeed, several significant imputations are already made. In the case of unpaid work however, there are several competing approaches to imputing value, none of which is entirely satisfactory. Moreover, as shown later, the imputed values are quite sensitive to the method chosen and the assumptions made. The imputation of the value of unpaid work would be much more subjective than the estimation of most national accounts aggregates.

e) Too many imputations, or very large ones would render GDP and other aggregates less useful as short-term economic indicators and forecasting tools.²⁵ Keeping the distinction between the market and non-market sectors sheds light on the interrelationships between the two, while retaining GDP and other aggregates as analytical tools.

1.3 Scope and objectives

What counts as unpaid work? Whose unpaid work counts? How is it valued and for which years? The scope of this study is essentially defined by answers to these questions. Consideration of national accounting principles, recent practice in the measurement and valuation of unpaid work, the nature and reliability of the data, and the objectives of the study play an important role in answering them.

1.3.1 Scope

A full accounting of household production requires measurement and valuation of the resulting goods and services. Measurement of the various inputs, such as labour, material goods and the use of household appliances, would be required as well. This study focuses on the measurement and valuation of labour inputs to household production. Measurement of the outputs and other non-labour inputs is beyond its scope.²⁶

One of the most difficult and controversial questions in studies like this is what counts as unpaid work.

25. *Ibid.*, para. 6.22.

26. A full accounting of all inputs to household production may not be needed. For example, to devise a single measure of overall market and non-market production, only the labour inputs need to be measured. Non-labour inputs are already counted as personal expenditure on goods and services in GDP.

23. Ann Chadeau, "What is Households' Non-market Production Worth?" *OECD Economic Studies*, 1992, p. 87.

24. *SNA 1993*, p. xliii.

There is no definitive answer to the question, but there are some guidelines and past practices to go by. National accounts guidelines recommend limiting the scope to those unpaid activities yielding goods and services which in principle could be exchanged.²⁷ Previous Statistics Canada studies dealt with household work, the unpaid work households do by and for themselves, like domestic chores, looking after children and shopping. The scope here is somewhat broader, extending to volunteer work and helping out friends, relatives and others.

Ideally, since everyone's unpaid work counts, a complete coverage of the population is desirable. The study's coverage, while broader than in earlier studies, is limited to people aged 15 and over in private households, which still represents about 95% of the population in that age group. Beyond these limits there is little information, making measurement and valuation impractical.

The national accounting approach to valuing non-marketed goods and services, which is to assess value in relation to cost rather than benefits, is taken here. Generally, national accounting guidelines recommend the imputation of cost at the price of an equivalent marketed good or service, as a first best approach. Imputation at the cost of inputs is recommended as a second best approach.²⁸ Two common cost-based methods of valuation are applied in the study, opportunity and replacement cost. With the former method, the unpaid labour of a person who earns or could earn \$20/hr. on the market is valued at that rate. With the latter, time spent preparing meals at home, for instance, is valued at the earnings of cooks, say \$15/hr. on average. Two variants of each method are applied. Opportunity cost is imputed before taxes and after taxes. Replacement cost is imputed on the basis of earnings either of domestic staff (i.e., the generalist method) or in occupations similar to specific types of unpaid work (i.e., the specialist method).

The study covers selected years over the period from 1961 to 1992. Previous studies have provided estimates of the value of household work for 1961, 1971, 1981, 1986 and 1992. Usually, the measurement and valuation of unpaid work coincides with years for which there is a national time use survey, here 1981, 1986 and 1992. Estimates for 1961 and 1971 are based on modelling and extrapolation procedures.

27. *SNA 1993*, para. 1.20.

28. *Ibid.*, para. 2.68.

1.3.2 Objectives

The main objective of the study is to obtain historical estimates with standardized definitions and methods, in order to assess trends in unpaid work over the last three decades.²⁹ Estimation back to 1961 is somewhat difficult, but necessary to see the effects of the steady influx of women into the paid labour force. Many other significant changes to the social fabric of the country, its demographic make-up and the structure of the economy occurred over this period as well. Section 1.5 discusses some of these.

The study examines some of the issues raised in Statistics Canada's first report on household work, but which received little attention in subsequent updates. It revisits the conceptual underpinnings of measurement and valuation and some of the associated practical problems. It also tests how sensitive the estimates are to the assumptions made.

1.4 Summary findings

How much time do Canadians spend on unpaid work? What is its value? How have these changed over time? What has been the influence of time use, demographics and women's participation in the labour market? And what are the implications for the measurement of economic growth? This section addresses these questions through a brief summary of the study's results.

1.4.1 Time spent on unpaid work

The results indicate that Canadians aged 15 and over spent 15 billion hours on unpaid work in 1961. Largely due to population growth, the total was up to 25 billion hours in 1992. By comparison, this is 23% more than the total hours worked in paid employment. And it translates into 7.5 million full-year, full-time job equivalents in 1961 and 12.8 million in 1992, on the assumption of 40 hours of work a week during 49 weeks. Canadians aged 15 and over spent on average 1,220 hours on unpaid work in 1961 and 1,160 hours in 1992.

29. Previous studies have looked at trends over shorter periods. Adler and Hawrylyshyn analysed trends from 1961 to 1971, Swinamer, 1971 to 1981, and Jackson, 1981 to 1986. It is difficult to compare their results, however, due to modifications to estimation procedures.

While women are spending less time on unpaid work, men are spending more, due in part to their declining participation in the labour market since the early eighties. Nonetheless, about two-thirds of the time spent on unpaid work is contributed by women. Their share has declined only marginally since 1961, despite nearly a doubling in women's labour force participation rate.

Household work takes about 95% of time spent on unpaid work, with the balance devoted to voluntary work. Meal preparation is by far the single most time consuming activity, taking close to one quarter of the time spent on unpaid work. Time spent on formal volunteer work and helping out friends, relatives and neighbours, while a relatively small proportion of unpaid work, still amounted to over 730,000 full-year, full-time job equivalents in 1992.

The results indicate changing patterns of unpaid work, with less time devoted to meal preparation and care of household members, and more to cleaning, clothing care, repairs and maintenance, household management and shopping. The division of these tasks between the sexes is changing as well. Women are spending more time on cleaning, management and shopping, transportation, and formal and informal voluntary work, while men are spending more on meal preparation, laundry and clothing care, repairs and maintenance, and care of household members.

1.4.2 Monetary value of unpaid work

The results also indicate substantial variation in the aggregate dollar value of unpaid work (VUW) over time and according to the valuation method. For instance, the difference between the lowest and highest estimates amounted to 22% of GDP in 1992. And at current prices, VUW increased substantially, due to population growth and especially to the rise in nominal wages. VUW at replacement cost (generalist approach) typically yields the lowest estimate at current prices, \$14 billion for 1961 and \$235 billion for 1992. VUW at opportunity cost before tax, based on average gross hourly earnings, yields the highest estimates, \$26 billion for 1961 and \$374 billion for 1992. Opportunity cost estimates based on after-tax earnings and replacement cost estimates based on the earnings of specialists typically fall between these extremes.

Table 1.1 puts the aggregate dollar value estimates in perspective by expressing them in relation to GDP at

market prices. The replacement cost (generalist approach) estimate is about 34% of GDP in both 1961 and 1992. This contrasts with the results obtained through other methods, each of which yields a decline of VUW relative to GDP and results from an above average rise of wages in personal service and child care occupations, especially since 1981. The increasing gap between the before-tax and the after-tax opportunity cost estimates over the period results mainly from the rise in marginal tax rates. As with earlier studies, the ratio of VUW to GDP varies significantly by province; it is generally higher in the Atlantic region and Quebec and lower in provinces with a higher employment rate such as Ontario and Alberta.

Table 1.1

Value of Unpaid Work Relative to Gross Domestic Product

Year	Opportunity cost		Replacement cost	
	Before tax	After tax	Specialist	Generalist
	percent			
1961	63.6	52.4	55.6	34.2
1971	57.5	40.5	50.1	30.5
1981	47.6	31.3	39.5	25.6
1986	44.6	28.0	37.5	26.1
1992	54.2	32.0	43.0	34.0

Estimates expressed in terms of annual averages per person at current prices offer another perspective. On an opportunity cost after tax basis, the annual average value of unpaid work amounted to \$1,780 in 1961 and \$10,270 in 1992. On a replacement cost basis (generalist approach), it amounted to \$1,160 and \$10,890 for the same years. The rise in nominal wages is the main underlying factor behind the increases over time. The averages hide some significant variations among demographic groups. For instance, the replacement cost of the unpaid work of not employed wives with children exceeds \$24,350 in 1992.

1.4.3 Unpaid work and economic growth

As indicated in Table 1.1, the value of unpaid work declined relative to GDP over the period under study. The most pronounced declines occurred over the expansionary sixties and seventies, which witnessed the most rapid influx of women into the labour market. The ratio of VUW to GDP continued to fall in 1981 and

1986, but less markedly, before rising substantially in 1992 for all valuation methods. The economy, as measured by GDP, generally expanded over this period but much more slowly than in the previous two decades.

GDP at constant prices grew by 3.9% a year from 1961 to 1992 and the value of unpaid work, also at constant prices, by under 2% a year. Therefore, the increase of both market and non-market production, measured as GDP plus households' unpaid work, would have been less than that of GDP alone, on average by 0.8% a year, on the assumption of no gains in household productivity. With a gain of 2% a year in household productivity, about that of the paid labour force from 1961 to 1992, the increase of GDP plus VUW at constant prices matches that of GDP.

1.4.4 Unpaid work in the past, present and future

One of the study's most interesting findings is the gradual decline of VUW relative to GDP in each year up to 1986, followed by a marked increase in 1992. Does this result signal a fundamental departure from the past or does it merely represent a statistical aberration, due to the study's sources or methods? Ideally, a more complete and up to date time series of estimates would be needed to answer this question. Nonetheless, there are ways to examine the reliability of the findings. Tests discussed in Section 4.3 show that it would take fairly large errors in the time use data to substantially alter the estimates of VUW. The same pattern of decline and reversal holds in twenty alternative estimates, made with different imputed hourly costs for unpaid work.

The hypothesis that the trend reversal in 1992 is due to a statistical aberration is not easily dismissed, nor is it easily supported. As the 1981 survey on time use was carried out in September and October, the 1986 survey in November and December, and that of 1992, throughout the year, seasonal effects do influence the estimates. However, the results of the 1992 survey indicate that people spend about 2% more time on unpaid work during November and December than on average and almost 3% less during September and October. Such small seasonal variations have little effect on the ratio of VUW to GDP. On the other hand, the effort to obtain detailed information varied across the surveys. The average number of reported activities was only 18 per respondent in the 1986 survey,

28 and 21 for those of 1981 and 1992. But it is hard to see how this factor could lead to such a marked reversal.

The question arises as to whether the reversal of the trend is long-lasting. Again, a more complete time series is needed to address the issue. Several underlying factors appear to be at play. Some of them are transitory and have transitory effects (e.g., the rise and fall of real family income with employment and general economic conditions). Others are more long-lived and their effects unfold over decades (e.g., the decline in the number of children until the mid-seventies and the increase thereafter, as the baby boom generation moved into the child bearing age group). The following section discusses all of these factors.

1.5 Unpaid work in the broader context

What factors influence the time devoted to unpaid work and the kind of activities undertaken? A basic premise here is that households' unpaid work is very much a part of the general socio-economic milieu in which it takes place. An understanding of how and why its nature changes over time cannot come solely from statistics on its amount and value. Unpaid work needs to be examined in the broader historical and socio-economic context.³⁰

The nature of household production and its relationships with the market economy have changed significantly over time. In the early part of the century, household production was more labour intensive and paid domestic servants were far more common than they are today. From the 1940's to the 1960's, however, households increasingly relied upon new technologies and their own labour to provide for themselves, and paid domestic servants virtually disap-

30. See Cowan, "The 'Industrial Revolution' in the Home: Household Technology and Social Change in the 20th Century," *Technology and Culture*, 1976; Day, "Capital-Labor Substitution in the Home," *ibid.*, 1992; Gershuny, "Changing Use of Time in the United Kingdom: 1937-1975, the Self-Service Era," *Studies of Broadcasting*, 1983; and Schor, *The Overworked American: The Unexpected Decline of Leisure*, 1991, for studies of historical trends in household work. For a more formal attempt to relate household production with various indicators, see Chadeau and Roy, "Relating Households' Final Consumption to Household Activities: Substitutability or Complementarity Between Market and Non-Market Production," *Review of Income and Wealth*, 1986.

peared as an occupational class. Since the 1960's, the diffusion of new technologies has continued, although in some instances a trend back toward reliance on market substitutes (e.g., meals and child care) has taken place.

1.5.1 Demographics

Canadians typically belong to smaller households today. Average household size declined from 3.9 persons in 1961 to 2.6 in 1992. Smaller households do less household work than larger ones. They also have fewer opportunities to take advantage of economies of scale. The time taken to prepare dinner for three, for example, is not much different from that required to prepare a comparable dinner for two. The reduced scope for economies of scale, division of labour and specialization resulting from the decline in household size has a negative effect on household productivity.

The decline in average household size is related to some notable changes in the family structure. While the husband-wife (or common-law) family is still the most prevalent family type, the number of lone parent families and people living alone has grown substantially since 1961. Divorce and separation are much more common, and more elderly people are living alone. Because time use patterns differ across family types, changes in family structure influence the nature of unpaid work. For instance, extended family households are less common and more time is spent helping relatives living outside the household.

At the height of the post-war baby boom, children under age 5 comprised over 12% of the population. Their share has declined since then, to about 7% in 1992, although their numbers declined only to the mid-seventies and increased thereafter. The fewer the number of children and the older they are, the less time is needed for child care and related activities. There are implications for the market economy as well, insofar as women with young children withdraw from the labour market temporarily or seek child care services.

A significant aging of the population has taken place since 1961, with the decline in fertility rates, the increase in life expectancy and the aging of the baby boom generation. People aged 65 and over made up about 8% of the population in 1961, against 12% in 1992. While the elderly are healthier than in the past, many of them, especially the oldest, are in need of

help and care from their relatives and others. On the other hand, they do not have the pressing commitments related to a paid job and children at home and have more time to engage in volunteer work and other informal helping and caring activity.

Finally, Canadians are increasingly living in urbanized areas. Seventy percent of the population resided in cities and towns in 1961, versus 77% in 1991. Access to market goods and services is often more limited in rural areas and the rural population, almost by necessity, is more self-reliant than its urban counterpart. Consequently, urbanization affects the amount and types of activity channelled through the market and non-market sectors of the economy. With the growth of suburbs, for instance, people spend more time commuting to and from their jobs and have less time for other pursuits.

1.5.2 Dwellings and technology

Canadians are living in dwellings with more rooms and amenities than in 1961. The average number of rooms per dwelling increased from 5.4 in 1961 to 5.9 in 1992 and virtually all dwellings today have hot water supply, baths, showers and flush toilets. Roughly 15% to 20% of dwellings were without such facilities in the early sixties. Sixty-five percent of households lived in single-detached dwellings in 1961, compared with 57% in 1992. Here again, the composition of the dwelling stock influences both the amount and types of unpaid work. For instance, indoor cleaning generally increases with the number of rooms. And apartment dwellers generally spend less time on home repair and maintenance, outdoor cleaning, gardening and grounds maintenance.

Several major household appliances are far more commonplace today than in the early sixties. Almost all households now have an electric stove, a refrigerator and a vacuum cleaner. Roughly three out of four households have a microwave oven, a freezer, an automatic washer and a dryer; 44% had a dishwasher in 1992, against less than 2% in 1961. The use of household appliances raises the productivity of labour and, potentially, can save time and make some tasks easier to do. It may also lead to more time being spent on appliance repairs and maintenance and/or seeking repair services.

Paradoxically, several studies have found that time spent on household work has remained fairly constant over time.³¹ Part of the explanation lies in

rising standards of quality and cleanliness. For example, automatic washers have substantially eased the burden of laundering in comparison with the old-style wringer washers. Nowadays however, clothing and linen is being cleaned more often. Second, the availability of cheaper and more efficient equipment leads households to do some things themselves rather than purchase market substitutes (e.g., use of a microwave oven replacing purchase of take-out food).

1.5.3 Labour market participation and income

Women's rate of participation in the labour force almost doubled in the last thirty years, reaching 58% in 1992. Men's participation, on the other hand, has declined several points to 74%. Women are much more likely to be employed on a part-time basis than men. From 1976 to 1992, between 19% and 24% of employed women aged 25 and over worked part-time. Among males, the proportion of part-time employment has risen only gradually, reaching 4.2% in 1992.

Labour force participation indicators are relevant in studies like this for at least two reasons. People with paid jobs generally have substantially less time to engage in unpaid work than those without. They must attempt to balance the demands of both job and family responsibilities. To some degree, women's higher part-time employment rate is indicative of this balancing act. Second, paid jobs provide income with which to purchase household equipment or market substitutes for unpaid work.

Participation of women in the labour market has a significant impact on time spent on child care and on the demand for market child care services. The participation rate of women with children under three years of age almost doubled between 1976 and 1991 alone. The demand for both public and private child care services has grown in tandem. Men's participation rate, on the other hand, is likely to have an effect on the time spent on gardening and home and grounds maintenance.

The increase in women's employment since 1961 also coincides with a rise in family income. Average

family income, expressed in 1993 dollars to account for inflation, rose from \$29,060 in 1961 to \$54,660 in 1992.³² There was a steady increase until the late seventies, but the pattern has been uneven since. Average income peaked at \$54,410 in 1980, then declined with the recession to \$51,370 by 1983, before rising up to \$57,280 by 1989, and has been falling again with the latest recession.

Additional income can be spent in different ways, on market substitutes to home production, such as convenience foods, or on household appliances making home production more efficient. One of the consequences of the rise in income is that households have more money to manage, expenditures to make, investments to consider, etc., so that over the years, management of household finances and shopping become more time-consuming. Also, insofar as income influences households' decisions to do things themselves or turn to the market, the cyclical variations in income contribute to counter-cyclical variations in unpaid work.

1.5.4 Spending on goods and services

Typically, economists confine themselves to analysing goods and services in terms of expenditure, paying little attention to their ultimate use. Yet further analysis offers valuable insight into the links between unpaid work and the market economy. The expenditures are indicative of the activities that households undertake or avoid, as the case may be. Household spending patterns have changed significantly since 1961. In some cases, there is an increased reliance on the market. The ratio of spending on meals outside the home to spending on food for meals at home more than doubled, from 21% in 1961 to 47% in 1992. And spending on child care outside the home (including subsidies for day care expenses) increased from \$37 million in 1961 to \$2.8 billion in 1992, making it one of the fastest growing components of household expenditure.

In other instances, the reverse is true, with indications of more self-reliance on the part of households. With the rise in the proportion of households owning at least one vehicle (69% in 1961, against 76% in 1992) or two or more vehicles (8% in 1961, versus 41% in

31. See Vanek, "Time Spent in Housework," *Scientific American*, 1974.

32. *Income Distributions by Size in Canada, 1993*, Cat. No. 13-207, Table 1.

1992), public transit and taxicab services are among the slowest growing categories of household expenditure. And with more households owning a washer and a dryer, spending on laundry and dry cleaning services has actually dropped in real terms (that is, at constant prices), despite an increase of over 190% in spending on clothing from 1961 to 1992.

A key determinant of household spending is the price of goods and services. Generally, the price of substitutes to household production, such as meals outside the home and child care services, has risen more rapidly than that of complementary inputs like refrigerators, stoves, washers and dryers since 1961. As measured by the implicit price index, the price of meals outside the home rose over 700%, that of domestic services and child care in the home by 500%, and that of child care outside the home by over 540%, from 1961 to 1992. By comparison, among the major household appliances, washers and dryers had the highest price increase over the same period, about 110%. The relative prices of complements and substitutes influence, and at the same time are partly a reflection of, the behaviour of households. For example, the increase in the cost of obtaining child care outside the home is related to the higher demand for such services.

1.6 Outline of the report

The following chapters cover various aspects of the measurement and valuation of unpaid work. The report is organized into a discussion of the underlying concepts and definitions (Chapter 2), description of the study's sources and methods (Chapter 3), analysis of the main results (Chapter 4), and a comparison with similar studies for Canada and other OECD countries (Chapter 5).

What counts as unpaid work? Whose unpaid work counts? And how is it measured and valued? Chapter 2 deals with these questions from a conceptual point of view. It examines basic notions like productive activity, economic value and the household as a productive entity, as well as the various definitions of household work and production, with emphasis on the third person criterion. Then follows a brief discussion of measurement, in physical or monetary terms, of inputs to, or outputs from, household production. The different types of survey questions on time spent on unpaid work are also compared. Last comes the description of the two valu-

ation methods employed in the study, namely opportunity cost and replacement cost.

Chapter 3 offers a practical perspective on the questions addressed in Chapter 2 through discussion of the study's sources and methods. The various sections describe population counts, classification of activities and occupations, estimation formulas, data limitations, and so on. The main refinements and modifications to previous Statistics Canada studies on unpaid work are also briefly outlined.

What is the value of unpaid work in Canada and how has it changed over time? What explains these changes? And how sensitive are the results to the underlying data and assumptions? Chapter 4 answers these questions in some detail. Trends in unpaid work are analysed by valuation method, by province, by demographic group, and by type of activity. Trends in underlying variables such as demographics, time use and time costs are examined as well. A broader measure of economic growth, defined as GDP plus the value of unpaid work at constant prices, is calculated. Last, a variety of alternative estimates of the value of unpaid work are discussed as part of a series of sensitivity tests.

How do estimates for Canada compare with those for other OECD countries? Chapter 5 compares methods and findings of studies that provide national level estimates for broad segments of the population. The estimates are expressed as a proportion of GDP for comparison purposes. The conclusion summarizes some general issues and concerns with the measurement and valuation of unpaid work and indicates some directions for future work.

2 Concepts, definitions and measurement

The concept of economic activity relates primarily to activities which give rise to monetary exchange. In principle, the measurement and valuation of economic activity, so-defined, is relatively straightforward. Monetary transactions are typically recorded and summary information on what is exchanged, between whom, at what prices, places and dates, can be obtained through surveys and administrative records.

The notion of economic activity underlying the measurement and valuation of households' unpaid work extends the conventional concept. In this case, economic activity comprises those kinds of activities which are, or **conceivably could be**, the object of monetary exchange. The extension is relatively straightforward in principle. Yet the measurement and valuation of households' unpaid work are not straightforward even in theory, since there are no records of its occurrence, of what is or could be exchanged, between whom, and so on. Moreover, there is no agreement on what constitutes unpaid work or on how to value it, and estimation entails applying non-standard methods which yield results of still uncertain accuracy.

The primary aim in either case is the measurement of output resulting from economic activity. It is the output that is ultimately exchanged (or exchangeable) between producers and consumers. Productive activities take many forms and yield a diverse assortment of goods and services, and various measures can be used to estimate output. However, the aggregation of the output of all producers, market and non-market alike, requires some common measurement unit, like the dollar or hours of work.

In practice, measures of market production and households' unpaid work are not always consistent with their underlying concepts. This reflects the need for adaptation to actual data, which are often less than ideal. For instance, although in theory GDP includes all economic production without regard to its legality, some illegal and underground transactions escape

measurement as they leave few trace records.¹ Similar problems arise with unpaid work.

The fact that most market production leaves trace records, while most unpaid work does not, leads to some contrasts in their measurement. The measurement of market production is based largely upon administrative and accounting records. In contrast, households keep few, if any records of their unpaid work, which makes measurement more problematic. In addition, since unpaid work involves no transactions, its entire valuation must rely on some sort of imputation. While the valuation of most market production is made at objective prices, that of unpaid work is to some degree subjective.

These issues are discussed in more depth below. Section 2.1 covers some of the basic concepts. Section 2.2 focuses on the definition of unpaid work and highlights several defining criteria. Section 2.3 describes in general terms the various approaches to the measurement of unpaid work. Section 2.4 deals with the time use survey, comparing the respective merits of the direct approach and the diary approach. The last section discusses the two most common methods for valuing unpaid work, namely opportunity cost and replacement cost.

2.1 Concepts

In the national accounts, households are treated primarily as consumers of market goods and services, rather than as producers. To treat them as producers, however, some basic questions need to be readdressed. What is an activity? What distinguishes productive or market activity from other types of activity? What is economic output? What is economic value? What is a household and how does it behave as an economic entity?

2.1.1 Activities and time use

An activity is something, literally anything, that someone does. One of its key characteristics is that it takes or uses time. Sleeping, eating, bathing, resting, reading, working, playing, all take time. Some activities are mutually exclusive. One cannot wash dishes

1. A recent Statistics Canada study examines this issue in some depth. See Gervais, *The Size of the Underground Economy in Canada*, 1994.

and drive a taxicab at the same time for instance. This simple observation underlies the opportunity cost approach to valuing unpaid work. In many instances, two or more activities can be undertaken simultaneously. One can look after children, do the ironing, and listen to the radio at the same time. This characteristic of time use creates substantial difficulties in measuring and valuing it.²

Activities can be distinguished from tasks: a task is something to be done, not the act of doing it. Some tasks (and the activities they give rise to) can be delegated to other people. Paid employees are delegated certain tasks by their employer, as part of their job. Households can delegate meal preparation to restaurants, transportation to taxi drivers and grocery pick up to delivery services or paid domestic employees, as part of routine daily operations. This basic idea underlies the replacement cost approach to valuing unpaid work.

In some instances, goods can serve as substitutes for particular activities and as complements to certain processes. Automatic dishwashers are a substitute for washing dishes by hand and a complement to the 'meal clean-up' process. Moreover, money can be a substitute for activity, and *vice versa*. One can make a charitable donation instead of volunteering one's time, for instance. One of the keys to understanding the links between the market and non-market sectors of the economy is recognizing when activity is transferred from one sector to the other and when market goods and services serve as complements to, or substitute for, households' unpaid work.

Some activities can be postponed, or may be undertaken in different places. The kitchen wall can be repainted in the morning or afternoon, today or tomorrow, this week or next week, and so on. One can play with the children in the living room, in the back yard, at a relative's home, or at the park. Some activities are fixed in time and space. The kitchen wall can only be repainted where it is located. Children are generally tucked into bed at bedtime. Paid work can be fixed in time and space as well, *via* an employment contract. The possibility of shifting activity through time and space and constraints on doing this have an important bearing on the valuation of unpaid work.³

2. When two or more activities occur at the same time, one is identified as the primary, or more important, activity and the other(s) as secondary activity. The primary activity is determined on the basis of the respondent's perception.

Activities may be pleasurable to varying degrees or not pleasurable at all. People can have different views with respect to the same activity. Even one person can have different views, depending upon circumstances or context. The mother who spends an hour a day looking after her children may wish to spend more time with them (the activity is pleasurable). If she spent most waking hours, every day, looking after them, she may wish for a brief escape (the activity is no longer or is less pleasurable at the end of the day). For the purposes of this study, (dis)pleasure has no bearing on the classification of activities. Nonetheless, it does have some bearing on their measurement and valuation.⁴

2.1.2 Productive activity

In principle, an activity is either productive or non-productive. The distinction between the two hinges on what is deemed as output. In a broad sense, all activities yield something, if only a different state of physiological or psychological well-being. While relevant in some contexts (e.g., a system of health accounts), this conceptualization is not very useful here. It goes well beyond the notion of economic activity related to exchange. If the distinction between productive and non-productive activity is to be meaningful, whatever is deemed as an activity output must be something other than utility (another term for well-being). Otherwise, there can be no distinction between production and consumption as both would contribute to output.

A somewhat narrower notion of productive activity relates to those activities that yield output capable of being exchanged. As Hill points out, "if this possibility does not exist, there can be no markets, no specialist producers, no industries, no division of labour, and whatever it is hoped to achieve by engaging in the

3. A household may postpone an activity to a more convenient time, in other words, to a period where its time cost is lower (e.g., evening or weekend). By the same token, the market substitute for an activity carried out at an awkward time or place (e.g., feeding an infant at 3 a.m.) may not exist or be available only at a substantial premium. The varying cost of time to the household or of the market substitute is rarely taken into account in the valuation of unpaid work.
4. To the extent that productive activity is enjoyable, more time may be devoted to it than needed. If gardening serves as a form of relaxation, one may take one's time at it, more time than needed to produce a well-tended garden. By the same token, the quality and, hence, the value of goods and services produced may well depend on whether their production is enjoyable or not.

particular activity in question it is not the production of goods and services.”⁵ The preparation of a meal can be the object of an exchange (meal preparation is productive). The well-being arising from eating a meal, on the other hand, cannot possibly be exchanged (eating a meal is non-productive). In the same sense, working for pay and looking after one's children are productive. In the first instance, an exchange actually occurs since the employee is remunerated for services rendered. In the second instance, it is conceivable that one could pay someone to look after the children, or be paid to look after the children or someone else's children instead.

Some activities do not lend themselves to exchange. They include biological, social, recreational and personal activities like sleeping and eating, meditation and prayer, receiving a hair cut, watching a sunset or television, skiing or taking a leisurely walk, and so on. These activities are nonetheless important and valuable, if only because someone believes they are worth doing. Moreover, they embody a cost associated with the use of time and some are necessary for survival and physical, emotional and spiritual well-being.

The distinction between productive and non-productive activity is not always apparent. Waiting may be productive or not, depending on whether it is possible to get someone else to do the waiting (e.g., standing in a line to make a purchase is productive whereas waiting for the rain to stop is not). Getting to a restaurant may be productive or not, depending on whether one provides the transportation service (as the driver of the vehicle) or consumes it (as a passenger).

2.1.3 Market activity

In principle, an activity is either market or non-market. The distinction between the two hinges upon whether or not an activity gives rise to an actual exchange. It may be a two-way exchange of goods or services or an exchange of goods or services for money now or at a later date. The conventional approach is to treat all remunerated activity, including barter and unpaid work for a family farm or business, as market activity.

All market activity is productive in the narrow sense mentioned above, if only because it involves exchange. In other words, the exchange itself is

productive. In the case of the sale of an existing asset such as a used automobile, the economic output is not the existing asset, but rather the activities (services) related to the exchange itself.

Some market activities are not easily identified.⁶ For example, knitting a sweater may be a market activity or not, depending on whether or not the sweater is intended to be exchanged. Painting a neighbour's fence may be a market activity or not, depending on whether or not the neighbour provides or does something in return.

2.1.4 Economic value

The fundamental notion of economic value underlying the national accounts is that of exchange value. It corresponds to the worth of goods or services as determined in the marketplace. In principle, the market price provides an objective measure of exchange value, insofar as both the seller and buyer agree upon the amount of payment. Moreover, the market price can be ascertained from available information and does not require subjective adjustments on the part of the statistician. It reveals what the object of exchange is worth at least to the buyer and also its cost of acquisition. It also reflects the cost to producers of bringing goods or services to the market.

A potential buyer may reject the market price as too high and defer purchase or purchase something else instead. And just as the consumer may reject the market price, so may the producer. A potential producer (seller) may judge it too low to cover costs and may defer sale or seek other business opportunities instead. In the national accounts, this is irrelevant, because measurement focuses on actual transactions and exchanges. When the focus is on non-market activity and possibilities of exchange, the fact that potential buyers and sellers reject the market price is important (see Section 2.5.3).

Another notion of value, namely that of value-at-cost, is particularly useful for the valuation of production in a non-market setting. When there is no exchange and no market price, exchange value cannot be deter-

5. T. Peter Hill, "Do-it-Yourself and GDP," *Review of Income and Wealth*, 1979, p. 32.

6. Many of the borderline cases arise with so-called 'informal economic activities'. The concept has been clarified in the resolution of the fifteenth International Conference of Labour Statisticians, January 1993, concerning statistics of employment in the informal sector. See *SNA 1993*, annex to Chapter IV.

mined. The most obvious example of non-market production, apart from that of households, is that of the services provided free of charge or at a nominal price by governments and non-profit institutions. In the national accounts, these services are valued at cost, that is, as the sum of all costs entering their production (wages and other operating expenses). It is thus possible to impute a value in the absence of market prices.

The economic valuation of households' unpaid work is difficult and controversial. By and large, the difficulty is due to the absence of information and the need to impute value, while the controversy is about the choice of value imputation methods and the validity of their assumptions. To understand the approach here, it is important to distinguish between personal value on the one hand and exchange value and value-at-cost on the other.

The former relates to an individuals' subjective assessment of what something is worth to them. This value naturally differs among people and even the same person can reassess a value over time or as circumstances change. The worth (or benefit) of something as simple as a haircut, for example, is extremely difficult to assess. It varies according to the importance people attach to personal appearance, style, fashion and a host of other things. While useful in some contexts, such notions are impractical here. The valuation of households' unpaid work relies on the cost-based notions of exchange value and value-at-cost, rather than subjective notions of worth.⁷

To illustrate these different notions of value, consider the example of a life-saving operation for a newborn child.⁸ For the parents, the value of the operation is presumably so high as to be immeasurable. For society, the value of saving the child's life is presumably immeasurable as well. These values are not easily assessed and not particularly relevant to economic valuation because they do not reflect the resource cost of the operation, either the amount the parents have to pay for the operation in a private health care system (its exchange value), or the cost of

providing the operation in a public health care system (its value-at-cost).

2.1.5 Households as producers

Households can be viewed as economic entities, just like businesses. They are groups of individuals, related or not, residing in the same dwelling. They exercise common ownership or control over their members' financial, material and human resources. They constitute autonomous decision-making units within society. And they engage in all forms of economic activity, not merely consumption. Their individual economic actions (e.g., decisions to allocate resources to various uses or ends) have little or no effect on the market. Collectively, on the other hand, households can substantially influence the market. At the same time, market wages, prices and interest rates influence their decisions.

For the purposes of this study, it is useful to view households as small, single-establishment businesses producing largely on own-account (i.e., for themselves).⁹ Like any other production, that of households consists in using inputs (labour, capital, and goods and services) in order to produce outputs of goods or services to satisfy their needs. The way in which households manage their time and other resources is important as it affects the efficiency, productivity and well-being of the individual, the household and society as a whole. There are several distinctions between households and businesses however:

- a) Households produce mostly for their own consumption, whereas businesses produce for others.
- b) Households have unique information on their consumption needs and can tailor their productive activity to suit those needs. Businesses seek to customize their goods or services through product-line variety, but do not always precisely meet the needs of their customers.
- c) Advertising goods and services and delivering them to the marketplace are integral aspects of business which, in contrast, are not a concern of households.

9. Owner-occupier households are already treated in this fashion in the national accounts with respect to the production of housing services.

7. For an example of the valuation of subjective benefits, see Quah, "Valuing Family Household Production: A Contingent Evaluation Approach," *Applied Economics*, 1987.

8. The example is borrowed from Eisner. See his remarks in *International Conference on the Measurement and Valuation of Unpaid Work*, p. 123. See also Goldschmidt-Clermont's example of the value of a home-baked birthday cake in the same proceedings, p. 70.

d) Businesses typically produce a limited range of goods or services on a relatively large scale. They can thus take advantage of economies of scale, specialization and division of labour, with their attendant productivity gains. Such possibilities are limited within households.

e) Finally, businesses must attract customers to avoid going out of business. Households do not face such pressures.

2.2 Definitions of unpaid work

There is no official definition of households' unpaid work sanctioned by the United Nations, International Labour Organisation, or the Organisation for Economic Co-operation and Development. Nonetheless, several definitions of unpaid household work or production have been proposed and are discussed below.

2.2.1 Selected definitions

The variety in the definitions of household work and production emerges clearly in Table 2.1. The definitions however share a number of common threads: 1) the activities of households yield simultaneous tangible and intangible outputs; 2) market goods and services can be substituted for household work; and 3) household work is done by and for members of the household.

The notion that household work yields direct and indirect returns is explicit in Baker's definition and implicit in the others.¹⁰ Direct returns from household work, sometimes called process benefits, are the utilities (benefits) derived from the act of doing. They include things like enjoyment, satisfaction, experience, relaxation, self-esteem, pride, and so on. Such benefits can motivate people to undertake productive activity in the absence of monetary compensation and influence the amount of time devoted to it. Direct returns are activity outputs that cannot be exchanged. Indirect returns from household work, on the other hand, are the utilities (benefits) derived from consuming activity outputs that can be exchanged, like laundry and meal preparation.

10. The distinction between direct and indirect returns is discussed in Hawrylyshyn, "Towards a Definition of Non-Market Activities," *Review of Income and Wealth*, 1977.

Table 2.1

Definitions of Household Work and Production

"I view the concept of **household production** as activities not directly in the market sector but with direct (and sometimes indirect) economic value. That is, household production combines or creates family inputs to satisfy wants, builds up want-satisfying power in something or somebody, or yields products, services or knowledge (both within and between families)..." (Baker, "Household Production...", p. 31).

"...**home production** is by and for household members with the output having use value rather than exchange value...**Household production** is by and for household members and it is market replaceable in the sense that it could conceivably be delegated to a paid worker..." (Beutler and Owen, "A Home Production Activity Model...", p. 17).

"Activities are classified as **household work** when two criteria are satisfied: (1) the activities result in the production of goods and services that could be purchased in the marketplace, and (2) the activities could be done by a 'third person' without any reduction in the household's utility..." (Gates and Murphy, "The Use of Time...", p. 8).

"...**work at home** (like work in the market) is something one would rather have somebody else do for one (if the cost were low enough), while it would be almost impossible to enjoy leisure through a surrogate. Thus, one regards work at home as a time use that generates services which have a close substitute in the market, while leisure has only poor market substitutes..." (Gronau, "Leisure, Home Production and Work...", p. 1104).

"I define **household work** as those economic services produced in the household and outside the market, but which could be produced by a third person hired on the market without changing their utility to the members of the household..." (Hawrylyshyn, *Estimating the Value of Household Work in Canada, 1971*, p. 19).

"**Household work** is defined as nonmarket uses of time that result in the production of a good or service that could be purchased in the market..." (Murphy, "Comparative Estimates...", p. 30).

"...**household production**.... consists of those unpaid activities which are carried on, by and for the members, which activities might be replaced by market goods, or paid services, if circumstances such as income, market conditions, and personal inclinations permit the service being delegated to someone outside the household group..." (Reid, *Economics of Household Production*, p. 11).

"**Household work or household production** (consists of the) purposeful activities performed in individual households to create the goods and services that make it possible for a family to function as a family..." (Walker and Woods, *Time Use*, p. xx).

The distinction between direct and indirect returns corresponds to Beutler and Owen's distinction between home and household production. In their view, home production consists of non-separable and separable activities.¹¹ A non-separable activity generates mainly direct returns that are inextricably tied to the personal relationships between the provider and the recipient and is not readily delegated to a third party (e.g., giving emotional support or playing with children). In contrast, a separable activity provides largely indirect returns, is more readily dele-

gated and interpersonal factors play a lesser role in it (e.g., dish-washing and mowing the lawn). Household production is restricted to separable activities, by Beutler and Owen's definition.

The notion that household production generates goods and services that can be obtained in the marketplace, explicit in Gates and Murphy as well as Reid, can be found in more or less restrictive form in most definitions. In Gronau's view "work at home generates services which have a close substitute in the market." In Hawrylyshyn's view, it generates outputs that "could be produced by a third person hired on the market." Gronau's definition recognizes the important point that home produced goods and services are distinctly different from purchasable goods and services.

Many unpaid activities of households are carried out for members of other households, non-profit organizations, or the community at large. They are ruled out by Reid's definition, which is restricted to things done 'by and for' members of the household. This view is also shared by Hawrylyshyn as well as Gates and Murphy. Their definition of household work requires that substitution of market goods and services occur "without any reduction in the household's utility." In the case of unpaid work on behalf of other households or organizations, the households providing volunteer services get mostly direct returns from their involvement. They forgo these benefits if they delegate the volunteer work. Consequently, such activity is excluded by their definition.

2.2.2 The third person criterion

The notion that *an activity may be deemed productive if it can be delegated to another person*, the so-called *third person criterion*, has gained some acceptance as it provides a basis for making the distinction between productive and non-productive activity. Its underlying rationale is that a delegable activity yields an output that can conceivably be the object of an exchange. All paid activity satisfies the criterion as it is already delegated; what is actually done and for

what purpose do not matter so long as the activity is paid.

The criterion relates strictly to the technical feasibility of delegation. Whether an activity is enjoyable or not, would be delegated or not by some households, is remunerated or not, occurs as a primary or secondary activity, and is with or without market substitutes are not relevant to the question of whether or not an activity is delegable. Practice often departs from theory however. For example, child-bearing is delegable in theory, but may be left out in practice because the equivalent market service is quantitatively negligible. Similarly, it may be admitted that household management is partly delegable (e.g., decision-making and problem-solving). However, since this is often a secondary activity, in practice it is left out.

The main advantage of the third person criterion is that the activities that satisfy it do not depend upon social norms or institutional factors. The criterion is viewed as a means of defining a set of productive activities that does not vary across countries or over time, thus facilitating international and intertemporal comparisons of economic activity.¹² However, as it relates to the technical feasibility of delegation, it is dependent upon technology. Consequently, the set of delegable activities can change with technological advances. For example, before the introduction of the automobile, 'car driving' did not exist, but it is commonplace today. As another, perhaps more extreme example, in recent years new reproductive technologies have made it possible to delegate child-bearing.

The third person criterion can be criticized on the grounds that it rules out some valuable and demanding activities, in particular those related to the maintenance and improvement of 'human capital', like training, learning and exercising.¹³ Another criticism is that it yields too broad a set of productive activities. For example, in theory, bathing oneself or even reading a book could be delegated. In practice, other criteria are often used along with the third person criterion to distinguish between non-market productive activity and other non-market uses of time.

11. The term 'separability' is sometimes used to express the idea that producers and consumers do not have to be in each other's presence. For example, the person who eats dinner does not have to be present while the meal is prepared (meal preparation is a separable activity). But the person who wants a haircut must be present for the service to take place (hair cutting is a non-separable activity).

12. See Hill, "Do-it-Yourself and GDP," *Review of Income and Wealth*, 1979.

13. Investment in human capital is productive since it enhances 'productive' capacity. Moreover, it can involve a current payment in exchange for a future payback (e.g., student loans).

2.2.3 Other criteria

There are two distinct versions of the **market replacement** criterion. One requires that similar goods and services to those produced by households exist on the market (e.g., Murphy's definition). The other requires the possibility of hiring someone to undertake the unpaid work instead (e.g., Hawrylyshyn's definition). The market replacement criterion is more restrictive than the third person criterion, because it assumes payment along with delegation. Moreover, since social norms or institutional factors can influence what exists on the market, the activities that satisfy the criterion vary over time and among countries.

If an activity is undertaken for **remuneration**, it constitutes paid work. Unpaid work consists of those activities that are delegable and unremunerated. The distinction between remunerated and unremunerated activity, however, is easily blurred. For example, some view intra-household transfers of food, clothing, and lodging as payments in exchange for unpaid work.¹⁴ Similarly, it can be argued that wages embody an implicit premium for travel to and from the workplace, implying that the travel constitutes a component of paid work. In practice, the distinction can be made only when remuneration is explicit. Even then, some forms of remuneration such as income-in-kind are difficult to identify, so that some paid work may appear to be unpaid.

An important criterion is whether unpaid work is done **by and for members of the household** or members of other households or organizations. The criterion allows a distinction between household and other unpaid work. It is not without problems. For example, is travel to work undertaken for the benefit of the household or the employer? The answer depends upon whether or not the wage is deemed to include a premium for travel. If so, the travel can be viewed as being undertaken for the employer, and otherwise, for the household. In practice, it can be difficult to determine if the beneficiary of the unpaid work is a household member, so that some household work may appear to be other unpaid work and *vice versa*.¹⁵

The **utility equivalence** criterion is combined with the third person criterion to define household work. In this case, a household work activity is one which could be delegated to someone hired outside the household and would leave the household no better or no worse off as a result, that is, in a situation of equivalent utility. A problem with the criterion is that it is difficult to determine which activities, if delegated, would leave households no better or worse off.

While not explicit in any of the definitions, the delineation of households' unpaid work is often based on what is considered to be **normal or customary behaviour**. A broad set of activities pass the third person criterion. For example, the customary activities, at least for healthy adults, of washing and dressing oneself can be delegated in theory. It is however unlikely that they would be delegated to any significant degree. When they are undertaken for the sake of others, like a child or an aged parent, they are usually viewed as unpaid work.

Walker and Woods' definition hints at a criterion related to the **purpose or motivation** for undertaking particular activities. In practice, this criterion is often employed in classifying travel and transport activities as unpaid work or not, and often given pre-eminence over the third person criterion. Classification according to purpose or motivation however is always problematic; not only are activities undertaken for different reasons, but underlying motivations are not easily determined. Gardening or going to the shopping mall, for instance, may be undertaken for relaxation, escape, or just for something to do. If these are the primary motivations, the activities would not be delegated. Should they then be viewed as 'not-work' or not productive?

The definition of unpaid work is problematic at best. The criteria discussed above all suffer substantive conceptual and practical difficulties.¹⁶ Ultimately, some conventions need to be established here.

15. See Stone, *et al.*, "Design of the Statistics Canada Total Work Accounts System," 1994, for a system of accounts that tracks the sources and destinations of the outputs of paid and unpaid work.

16. See Chandler, Gray and Jackson, "The Boundaries of Economic Activity: An Application of 1993 SNA Principles," 1995, for elaboration on the problem of definition. In the 1992 time use survey, they find that about 28% of time is spent on activities that can be clearly designated as productive, and 8% on activities that cannot be clearly classified one way or the other.

14. Barbara Bergmann, "The Economic Risks of Being a Housewife," *American Economic Review: Papers and Proceedings*, 1981, p. 83. This argument takes a very different perspective, with the individual, not the household, as the basic economic unit.

baked.¹⁹ Children can be looked after by a baby-sitter at home, at a baby-sitter's home or at a day care centre.

The indirect method consists in measuring the volume of inputs and valuing them at cost. Since there is information on the labour, capital and other material inputs to household production, this method is feasible. However, it requires information about the use of household equipment and the consumption of certain goods and services in specific household activities. Moreover, in contrast to the direct method, it requires estimation of the depreciation of household equipment. To date, the indirect method has been applied in only a few studies.²⁰

2.4 Measuring time spent on unpaid work

The measurement of unpaid work requires time use surveys. There are no international guidelines on the subject, but some common practices have emerged. The multinational time budget study, for example, has served to guide the design of many subsequent surveys of time use in Canada and elsewhere and many classifications of time use are derived from it.²¹ This section discusses key features of time use surveys.²²

19. In her early 1980's study of households in Palo Alto, California, Goldschmidt-Clermont estimated a net hourly return to labour in pizza preparation of \$3.00/hr., using frozen pizzas as the market equivalent. Estimates of hourly returns from other activities varied considerably, from a loss of \$1.30/hr. in hand-knitting cardigans, with machine-knit cardigans as the equivalent, to a return of \$29.80/hr. in the preparation of home-made yogurt, with commercial yogurt as the equivalent. *Ibid.*, p. 114.

20. See Thoen, "The Value of Household Production in Canada, 1981 and 1986," 1993; Ironmonger and Sonius, "Household Productive Activities," in Ironmonger, ed., *Households Work*, 1989; Schäfer, "Time Use Data and Satellite System on Household Production: Methodological Aspects and Experience in Germany," 1994; and Vihavainen, "Calculating the Value of Household Production in Finland in 1990," 1995.

21. See Szalai, ed., *The Use of Time*, 1972.

22. There is a rather extensive literature on the measurement of time use. See Harvey, ed., "Research on Time Use," *Social Indicators Research*, 1990, and Juster and Stafford, "The Allocation of Time: Empirical Findings, Behavioral Models, and Problems of Measurement," *Journal of Economic Literature*, 1991, for some reviews.

2.4.1 Time use surveys

Several design features of time use surveys are relevant to the measurement of households' unpaid work. Ideally, since the aim is to measure all unpaid work done throughout the year within national boundaries, the survey should provide full coverage in terms of population, area, day of the week or season, and activities. In practice, this is rarely the case. Moreover, in the absence of international guidelines, practices vary from one survey to another.

The time use survey should cover all persons, regardless of age or residence (household or institution). For practical reasons however, most surveys do not provide full coverage. The *General Social Survey* for instance covers persons aged 15 and over in private households. Similarly, the survey sample is often drawn from only one or a few locations, with obvious drawbacks, although national surveys are more common nowadays. The time periods covered also matter because daily activity patterns vary during the week or according to season. Early Statistics Canada surveys for example were conducted only in the fall, although the most recent one was conducted over the entire calendar year.

While it is quite possible to design a sample which is representative of the population, area and time period, the complete coverage of activities is more problematic. Even with a clear definition of what constitutes unpaid work, some activities remain difficult to capture. Indeed, obtaining information on some activities can require such extensive questioning of respondents as to be impractical. Decision-making and time-management are productive activities which cannot be captured adequately with current survey methods.

2.4.2 Direct and diary approaches

The direct approach to measuring the use of time involves asking survey questions such as "how many hours did you spend last week on housework?" There are several variations on this basic approach. The question may be on usual or actual number of hours, or the usual or actual proportion of time spent on a particular activity in the reference period. This period may be the previous week, month or months, and may vary by activity. The activity may be broadly or narrowly defined (e.g., doing housework vs. vacuuming).

The diary approach requires the completion of a chronological log. The log itemizes and describes a respondent's activities as a sequence of episodes over a given reference period. For each reported episode, the diary contains at least a description of the activity and its start and end times. Additional information is often obtained on location, secondary activities or the presence of other persons, which helps to situate episodes of activity in their context.

There are several variations on the diary approach.²³ The diary can be structured into fixed intervals of 10, 15 or 30 minutes or unstructured. It can be left with the respondent to complete during some future reference period or completed with the aid of an interviewer shortly after the reference period. In the latter case, the recall period is one day or, at most, three days. The reference period varies in length, but is typically 24 or 48 hours. Respondents are asked to code their activities themselves, as instructed, or to describe them so that they can be subsequently coded.

The diary approach has a number of advantages over the direct approach.²⁴ The fact that a respondent has to report the activities of the day in chronological order ensures a fairly rigorous consistency in the response. Moreover, the process that a respondent goes through in completing the diary leads to a more accurate recollection of events. The direct approach is less systematic and rigorous. The respondent is not asked to account for all activities in sequence or to put them in context. He is required on the other hand to remember activities over a longer reference period and to estimate the time spent on them.

The diary approach also provides a way to distinguish simultaneous activities, whereas the direct approach does not. Investigation has shown that respondents tend to double-count the time spent on simultaneous activities, so that the total time reported for a day can exceed 24 hours.²⁵ With the direct approach, there are few ways of dealing with this problem. With the diary approach, a respondent who reports doing more than one thing at a time can be asked to identify one

as a primary activity and the others as secondary. As a result, time spent on primary activity adds up to 24 hours a day.²⁶

Another drawback of the direct approach is that the interpretation given to an activity varies among respondents.²⁷ The meaning of 'looking after children' or 'doing housework' is not at all clear. Some automatically consider playing with children as looking after them, and others do not. Shopping may be deemed a part of housework by some, but not others. Respondents can be given examples of what an activity is meant to cover, but this in itself does not guarantee consistency. The diary approach yields better results in this regard, since the respondent is simply asked to describe the day's activities, which are then coded according to a pre-defined scheme.

The direct approach has two main advantages over the diary one. For the same sample size, it covers a broader period and is thus more likely to capture infrequent activities like cleaning the furnace. For an equivalent coverage, the diary approach requires a larger sample (at additional cost) or a longer reference period (a heavier burden on the respondent).

2.5 Valuing unpaid work

Most economic valuations of unpaid work rely on the opportunity cost method or that of replacement cost. The two methods are applied in a variety of ways, depending on research objectives and data constraints. This section discusses the underlying idea, key assumptions, variations and shortcomings of each of them.

23. See Harvey, "Guidelines for Time Use Data Collection," 1990, for a detailed discussion.

24. For discussions of the relative merits of each approach, see Frederick, Norris and Villeneuve, "Measuring Unpaid Work: The Canadian Experience," 1992, and Juster and Stafford, "The Allocation of Time: Empirical Findings, Behavioral Models, and Problems of Measurement," *Journal of Economic Literature*, 1991.

25. Juster and Stafford, *ibid.*, pp. 482-485.

26. The measurement of secondary activity is not very precise as it is seldom based on its own start and end-times, but on that of the associated primary activity instead. Nevertheless, ignoring secondary activity can distort measures of time devoted to those activities that tend to be reported as such. Frederick addresses this issue through an examination of time spent on child care. See "Measuring Child Care and Sleep: Some Results from the 1992 Canadian General Social Survey," in Kalfs and Harvey, eds., *op. cit.*

27. Statistics Canada's most recent survey on time use provides a unique opportunity to compare the direct and diary approaches as both were employed for the same respondents. For a comparison of the results, see Paillé, "Estimating the Volume of Unpaid Activities in Canada, 1992: An Evaluation of Data from the General Social Survey," 1994.

2.5.1 Opportunity cost

The basic idea underlying this method is that time spent on unpaid work could be spent doing something else. In other words, the household's unpaid work has a cost: the forgone benefit of doing something else instead. This cost has an economic significance in that it can influence household decisions. The notion of opportunity cost itself is hardly controversial. More controversial, however, is its use in valuing unpaid work and the assumptions made.²⁸

Household members are typically assumed to act in accordance with their common interests, with the implication that the costs and benefits of individual actions are shared. They are presumed to behave rationally, allocating their human, financial and material resources to different uses with the objective of making themselves, as a group, as well-off as possible. Putting resources to specific uses however entails opportunity costs: they could have been put to other uses.

Resources are assumed to be allocated to those uses where the benefit outweighs the cost, with the implication that time allocated to unpaid work is worth at least its opportunity cost. If it is further assumed that time devoted to any one activity can be freely reallocated to any other at the margin, all uses of time have the same opportunity cost. For the employed, the opportunity cost of any use of time is the net marginal benefit from paid work. For the not-employed, the opportunity cost of any non-market use of time is deemed to exceed the potential net marginal benefit from paid work.

The opportunity cost approach is criticized generally for oversimplification and lack of realism and relevance.²⁹ The assumption of a commonality of interests for instance ignores conflict over who does what or who gets what within households. It implies either that conflicts do not arise or are always somehow

satisfactorily resolved. The assumption of rationality implies that households make well-informed and calculated decisions. At the same time, it ignores the extent to which social norms and tradition determine behaviour. Ferber and Birnbaum, among others, argue that these latter influences are inconsistent with rationality.³⁰

The assumption that households freely allocate their time ignores important institutional constraints such as mandatory retirement legislation. There are also limited opportunities to work for pay late at night or during the weekend, when many businesses are closed. The added assumption that time can be freely reallocated at the margin ignores the constraints of the fixed work schedule imposed in many paid jobs. Such constraints lead in theory to a divergence between the opportunity cost of any time use and the net marginal benefit from paid work.³¹

Even if these assumptions are accepted, applying the notion of net marginal benefit from paid work is exceedingly difficult. This benefit includes monetary income (wages and net income from self-employment), fringe benefits,³² income-in-kind and employers' social contributions. The latter yield entitlements to future income, such as pensions, or contingent income, such as unemployment benefits. Similarly, taxes on earnings may be viewed as yielding an entitlement to public goods and services. Apart from wages, most of these benefits are not easily measured or expressed in monetary values. The difficulty is compounded when making imputations for the not-employed.³³

30. *Ibid.*, p. 20.

31. If working hours are fixed, with no opportunity for overtime or a second job, the opportunity cost of unpaid work corresponds to forgone benefits from non-work (e.g., leisure). As a result, valuation of unpaid work at forgone earnings is biased. See Sirageldin, *Non-market Components of National Income*, 1969.

32. In Canada, fringe benefits refer to paid vacations, sick leave, etc. In Europe, they usually refer to in-kind benefits (food vouchers, company car).

33. The imputation for a person who is not employed is more problematic, as it entails estimating what she would earn if she sought and found employment. In some studies, as in this one, the imputation relies on the simplifying assumption that someone who is not employed could earn, on average, the same as those who are currently employed, categorized by sex, age, educational attainment, etc. In others, an attempt is made to estimate the 'asked wage' (that would induce someone to take employment) and the 'offered wage' (that an employer would offer that person). See, for example, Bryant, *et al.*, *The Dollar Value of Household Work*, 1992.

28. See Becker, "A Theory of the Allocation of Time," *Economic Journal*, 1965, and Gronau, "Home Production - A Survey," in Ashenfelter and Layard, eds., *Handbook of Labour Economics*, 1986, for elaboration on the theory.

29. For critiques of the opportunity cost method, see Berk, "The New Home Economics: An Agenda for Sociological Research," in Berk, ed., *Women and Household Labor*, 1980; Brown, "Home Production for Use in a Market Economy," in Thorne and Yalom, eds., *Rethinking the Family: Some Feminist Questions*, 1982; and Ferber and Birnbaum, "The New Home Economics: Retrospects and Prospects," *Journal of Consumer Research*, 1977.

The calculation of the marginal benefit from paid work requires knowledge of how benefits change with hours of work. For instance, an overtime premium may be paid on hours in excess of the standard work week. The calculation of the net benefit requires knowledge of deductions from pay and job-related expenses such as commuting costs and additional spending on food and clothing. Making a deduction for these items is not without conceptual and practical difficulties. Under a progressive tax system, for instance, the marginal tax rate increases with income, which itself depends to some degree on hours of work. Moreover, one must distinguish between variable and fixed costs (i.e., those that vary with hours worked and those that don't). Only the variable costs should be deducted in theory, but this may be difficult to do in the absence of the appropriate information.

2.5.2 Replacement cost

The main idea underlying this method is that households could forgo their unpaid work and purchase similar goods or services instead. To do so would entail a 'replacement cost'. Such costs are economically significant in that they can influence households' decisions either to do things themselves or delegate them to the market. As in the case of opportunity cost, the notion of replacement cost is not all that controversial. Here again, what is debatable is its application to the valuation of unpaid work and the assumptions made.

The main variants of the replacement cost method differ in their assumptions regarding the choice of market substitutes. With the market specialist variant,³⁴ the replacement cost of a given type of unpaid work is imputed on the basis of the hourly earnings of people employed in a similar occupation. The replacement cost for preparing meals or doing laundry for instance is established in relation to the hourly earnings of cooks and chefs or launderers, respectively. The basic premise here is that households can delegate tasks to businesses (and indirectly to their employees). In contrast, with the household generalist variant,³⁵ the replacement cost

for household work is imputed on the basis of the hourly earnings of domestic employees. The basic premise here is that households can delegate tasks directly to paid domestic staff. With either variant, households are assumed to have only one alternative, and household members are deemed as productive as market specialists in one case, or paid domestic staff in the other.

The assumptions underlying the replacement cost method can be criticized on a number of grounds. The assumption that all households either delegate to business or take on domestic employees goes against the evidence that some opt for one, some for the other, and others for both. It is argued as well that the appropriate replacement cost is that of the output of unpaid work, not the time spent on it.

The assumption of equal productivity, at least for the market specialist variant, is criticized as being unrealistic. It is emphasized that the work of market specialists is characterized by substantial division of labour, economies of scale and often more capital intensive production, with ensuing productivity gains. The assumption is viewed as more realistic with the household generalist variant, because domestic employees work in the same setting as household members, with the same equipment. But even then, it is pointed out that domestic employees do not undertake all household tasks, particularly those related to management as well as volunteer and community work. Bittman argues that this method was more relevant in the early twentieth century when domestic employees were more common.³⁶

The replacement cost method poses several practical difficulties as well. In particular, the market specialist variant requires matching occupations and unpaid work activities, which is done on a subjective basis. It also requires the choice of an appropriate group of persons from whose earnings replacement costs can be established. There are many possibilities here, but little theoretical guidance. Replacement costs can be based on the earnings of employees, the self-employed or both, those of full-time or part-time earners, or both, and those of managers, supervisors or elemental labourers. They can be established also on the basis of earnings by sex, age, education or other qualifications and applied to household members with corresponding characteristics. The

34. This variant is also called 'individual function replacement cost', 'wage for market equivalent function', and 'service cost'.

35. This variant is also known as 'housekeeper replacement cost' and 'wage for substitute polyvalent household worker'. An outdated variant, that of the household specialist, imputes replacement costs from specific types of domestic employees (e.g., cooks, maids, butlers, chauffeurs, nannies).

36. "Sexual Equality and Unpaid Work," in Kalts and Harvey, eds., *Fifteenth Reunion of the International Association for Time Use Research*, 1994, p. 161.

way these issues are handled in practice entails different assumptions about the productivity of unpaid work in relation to similar paid work.

2.5.3 Relevance of imputed values

The possibility to transfer activity to the market sector and *vice versa* is not merely hypothetical. Households regularly engage in such substitution, some more so than others. And many households at least consider the alternatives of doing some things for themselves or relying on the market, and the costs and benefits of doing so. For this reason, opportunity and replacement costs are not merely hypothetical. They are clearly relevant, for instance, to the dual earner couple with a newborn child, confronted with the difficult and complex decision to take care of the infant at home or to seek outside care.

Undoubtedly, opportunity and replacement costs vary among households, if only because households have different tastes, reside in different areas and face different prices and opportunities. However, in most studies like this one, the imputed values are estimated on the basis of aggregate or averaged data, so that factors that may influence opportunity and replacement cost for a given household are ignored. The imputed values are thus not representative for a specific household, although they may be on average.

On this last point, there is a debate as to the purpose of valuation itself. Some argue that values that are relevant for the analysis of the household are not always useful for macroeconomic analysis. This criticism is levied especially against the opportunity cost method. Others contend that the imputed values must be founded upon values that are relevant to the household, otherwise they are meaningless. Indeed, this latter view is supported in the *SNA 1993*, which recommends that "as a general objective, concepts, definitions and classifications used in economic accounting should, as far as possible, be the same at both a micro and macro level..."³⁷

As mentioned in Section 2.1.4, when households do certain things themselves, they implicitly reject the market, or equivalently, the market fails to deliver a satisfactory alternative. Households as suppliers of labour may deem the market wage too low (or working conditions unacceptable), withhold labour

from the market and put it to more valuable (or more agreeable) non-market uses instead. Alternatively, households as consumers of goods and services may judge the market price too high (or product quality too low) and produce for themselves at a saving (or at a higher quality). In either case, the implication is that the values imputed on the basis of market prices are not necessarily relevant for households who have rejected the market.³⁸

2.5.4 Adjustments to wages

There is the thorny question of how to treat income taxes, fringe benefits and social security contributions. The treatment depends both on the valuation method chosen and from whose perspective value is measured. It also requires assumptions about households' perceptions and behaviour.

In most applications of the opportunity cost method, where the intent is to measure value from the household perspective, the opportunity cost of unpaid work is approximated by the net or after-tax earnings (in other words, the take-home pay). This assumes that the entitlement to public goods and services (or the benefit derived from their consumption) is not tied (or perceived to be tied) directly to the income tax paid. There is wide agreement that the fringe benefits are part of the opportunity cost and ought to be added if not already included.

There is some disagreement however on how social contributions should be treated. The issue here hinges on whether households perceive any direct benefit from their contributions and those made on their behalf by the employer. If they perceive no direct benefit from social contributions, then the net earnings, or after-tax, approach is more appropriate. In this instance, the employers' social contributions are ignored and the employees' contributions must be deducted from gross earnings along with income taxes to arrive at the opportunity cost.

Conversely, if households perceive a direct benefit, then the gross earnings, or before-tax, approach is more appropriate. In this instance, the employers' social contributions must be added to gross earnings to arrive at the opportunity cost; the contributions paid

38. See Gronau, "Home Production - A Forgotten Industry," *Review of Economics and Statistics*, 1980, p. 414, and Goldschmidt-Clermont, *Unpaid Work in the Household*, 1982, p. 21, for some debate on this issue.

37. Para. 1.67.

by employees are already included in gross earnings. Murphy points out that the before-tax variant can be interpreted as providing 'social opportunity cost' estimates (i.e., the cost to society of unpaid work in terms of forgone national income).³⁹

Some take the view that replacement costs should be based on gross (before-tax) wages, to which should be added non-monetary fringe benefits not already included and employers' social contributions. The justification for this treatment is that households ultimately pay for these supplements to wages if they purchase market substitutes. Others reject this approach. Goldschmidt-Clermont, for instance, favours basing the imputation on wages net of taxes and of social security contributions, but inclusive of fringe benefits, on the grounds that unpaid labour does not give rise to social security contributions or to income tax payments.⁴⁰ A problem with this argument is that unpaid labour does not generate monetary income either.

Murphy favours adding employers' social contributions to gross wages for the household generalist variant, but not for the market specialist variant. In his view, households have to make such contributions if they hire domestic staff themselves, but not if they delegate their unpaid work to businesses.⁴¹ With respect to the market specialist variant, the argument is not very convincing, as these additional costs get passed on, in whole or in part, to households as consumers.

2.5.5 General criticisms

Perhaps the fundamental criticism addressed to all wage-based methods for the valuation of unpaid work (including opportunity cost and replacement cost) is that whatever the imputed values, they are not directly related to production in the household. As Goldschmidt-Clermont puts it: "the values arrived at are related to productivity in the market and not to productivity in the household; they are sensitive to factors

affecting market wages but which are unrelated to household productivity; they carry no relation to the value of the output in kind generated by unpaid household work."⁴²

With the opportunity cost method for instance, the imputed value of washing dishes can be \$18/hr. for a university graduate and \$10/hr. for a high school graduate, even though both do an equally good job. This seems inappropriate. Similarly, with the replacement cost method, a pay-equity raise given to day care workers leads to a higher imputed value for child care, without any change in the care provided by households. The general point here is valid, but it goes too far in suggesting that there is no relation between productivity in the market and that in the household sector. Productivity gains in the market can give businesses a competitive advantage in the production of household goods and services and induce less efficient households to switch to market substitutes, thereby resulting in higher average household productivity.

Another criticism that applies to any imputation of economic values, including those made in GDP, goes as follows: if households were actually compensated for their unpaid work at the imputed rates, wages in the economy would be fundamentally altered and the initial imputed values would be invalidated. This criticism is valid in the context of policy modelling, but it is misplaced here. The fact is that households are not compensated for their unpaid work. Their individual economic choices are influenced by actual market prices, not by hypothetical ones.

Finally, wage-based methods are criticised for reproducing the female-male earnings differential in the valuation of unpaid work.⁴³ This occurs in two ways: (1) women's unpaid work is valued in relation to their employment earnings and men's in relation to theirs, as is usually the practice with the opportunity cost, and sometimes with the replacement cost method; or (2) women's and men's unpaid work is valued at the same rate, but the activities in which women tend to spend more time are valued at lower rates than those in which men tend to spend more time, as is sometimes the case with the replacement cost method.

39. "Comparative Estimates of the Value of Household Work in the United States for 1976," *Review of Income and Wealth*, 1982, p. 33.

40. "Monetary Valuation of Non-Market Productive Time: Methodological Considerations," *Review of Income and Wealth*, 1993, p. 424.

41. "Comparative Estimates of the Value of Household Work in the United States for 1976," *Review of Income and Wealth*, 1982, p. 41.

42. Luisella Goldschmidt-Clermont, *Unpaid Work in the Household*, 1982, p. 35.

43. See Bittman, "Sexual Equality and Unpaid Work," in Kalfs and Harvey, eds., *Fifteenth Reunion of the International Association for Time Use Research*, 1994.

There are conceivably some simple solutions to these problems (e.g., valuation at an overall wage rate, perhaps broken down by age group or education, etc., but not sex), although none is very satisfactory. They must all disregard a basic reality which has real consequences for households. The female-male wage gap is real and mechanics are paid more than cooks. Households are confronted with this reality everyday. The statistician would be ill-advised to ignore it or conceal it.

2.5.6 The choice of method

The issue of the most appropriate method to value unpaid work is a complex one. In principle, the best approach consists in the direct valuation of the outputs of unpaid work, as described in Section 2.3.4. This method offers several advantages. Conceptually, it is consistent with the valuation of market production. It avoids the problem of dealing with simultaneous activities and simultaneous outputs and with differences in productivity among households, among types of unpaid work and between market and household work. It does not require the premise of rational behaviour on the part of households.⁴⁴ However, in the absence of appropriate data, it is hardly practicable.

As a second best approach, Goldschmidt-Clermont, among others, recommends the generalist variant of the replacement cost method, at least for household work, since domestic employees work in a similar setting and under similar conditions as household members. Hawrylyshyn favours this method as well, on the theoretical grounds that valuation ought to reflect the productivity and the wages of efficient workers.⁴⁵ Ferber and Birnbaum argue strongly in favour of the same method because it is simpler to apply and less subject to theoretical problems than other methods.⁴⁶

The choice of method is complicated by the fact that estimates of the value of unpaid work can be put to

several uses. It is a particularly difficult one for a statistical agency which aims to serve the information needs of a variety of users. Some recommend that estimates be developed according to several methods, in recognition of the diversity of needs and of the lack of agreement on a best (and, at the same time, practical) method.⁴⁷ This is the route Statistics Canada has taken, although it favours the replacement cost (generalist) method for national accounting purposes.

44. See Goldschmidt-Clermont, *Economic Evaluations of Unpaid Household Work: Africa, Asia, Latin America and Oceania*, 1987, p. 52-53.

45. See *Estimating the Value of Household Work in Canada, 1971*, 1978, p. 30-31. In practice however, given the poor quality of data on earnings of housekeepers, Hawrylyshyn judges the specialist variant the better of the two.

46. "Housework: Priceless or Valueless?" *Review of Income and Wealth*, 1980, p. 399.

47. See Ruuskanen, "Options for Building a Satellite Account for the Measurement of Household Production," 1995.

3 Sources and methods

The previous chapter described the concepts and definitions behind the measurement and valuation of unpaid work. This one deals with their application. It is organized as follows. Section 3.1 provides a general overview of sources and methods. Section 3.2 deals with the study's population and explains why some groups are left out. Section 3.3 deals with time use, the classification of unpaid work activities and the imputation of time spent on unpaid work in 1961 and 1971. Section 3.4 describes the opportunity cost and replacement cost methods and discusses the matching of unpaid work activities with occupations required for the replacement cost method.

3.1 Overview

The general approach taken here is comparable with Statistics Canada's first three studies on the valuation of household work. It involves estimating the value of unpaid work for specific groups of people and deriving a total from these estimates. This section outlines the study's main features, including: 1) coverage of population and activities; 2) valuation methods; 3) data sources; and 4) estimation formulas and statistics.

3.1.1 Coverage of population and activities

The study covers persons aged 15 and over in private households. Children under age 15, persons residing in collective dwellings and foreign residents are excluded. Both conceptual considerations and practical limitations preclude extending the study to all the population.

The population is subdivided into groups defined by province or territory of residence, sex, family status, number of children and, if any, age of the youngest, and labour force status. Classification is guided by considerations of relevance, reliability and comparability. The sample size of the time use surveys prevents subdividing the population further, by age group or by full-time versus part-time employment for instance. An attempt is made to avoid having a few or no respondents in a given group, but this sometimes occurs.

Unpaid work is fairly broadly defined. Nonetheless, some activities that can be viewed as productive (e.g., educating oneself, self-administered personal care) are excluded, while others that can be viewed as leisure (e.g., gardening, playing with children) are included. Like most studies of its kind, this one covers only primary activities which are reasonably well-measured and clearly identifiable as unpaid work.

Up to 70 types of unpaid work are identified in the various time use surveys. They are grouped here into 22 categories comparable across surveys. At the lowest level of detail, households' unpaid work consists of 1) domestic work, 2) help and care, 3) management and shopping, 4) transportation and travel and 5) other unpaid work. Household work, defined as unpaid work done by and for members of the household, corresponds to the first four categories above. Here again, the choice of categories, and hence the scope of the analysis, is partly dictated by practical considerations such as relevance, reliability and comparability across surveys.

3.1.2 Valuation methods

Four wage-based valuation methods are employed in the study: opportunity cost before tax (OC-BT), opportunity cost after tax (OC-AT), replacement cost - specialist (RC-S) and replacement cost - generalist (RC-G).¹ For each method, costs expressed at an hourly rate are derived according to a set of basic assumptions and procedures. The number of hours of unpaid work are then multiplied by these costs to yield an estimate of value. Several other estimates are calculated on the basis of alternate assumptions and used for comparison purposes.

Opportunity costs before tax are based upon average hourly earnings for persons aged 15 and over by sex and province/territory, to which employers' social contributions are added. Opportunity costs after tax are based on the same wage rates, from which employees' social contributions and an estimate of the marginal income tax rate are deducted.

1. Households are deemed to have two options, either to hire domestic employees or to delegate their work to business, with some opting for the former and others for the latter. This leads to the calculation of replacement costs on the basis of earnings by occupation alone, without regard to the identity of the employer (household or business).

Replacement costs are based on the average hourly earnings of persons employed full-year, full-time, by province and occupation. For the specialist variant, each of the 22 types of unpaid work is matched with an occupation which entails similar types of work. For the generalist variant, household work except child care is matched with personal service occupations and child care, with child care occupations. Volunteer work and other help and care are matched with the same occupations for both variants. Employers' social contributions are added to the hourly earnings to arrive at replacement costs.

3.1.3 Data sources

The census is the main source for both the number of people in each group and for employment earnings. It provides reliable population counts and is the only source for detailed information on earnings by occupation. Moreover, concepts and definitions from one census can be carried over to subsequent ones. This allows for data standardization which, in turn, entails relying on somewhat outdated concepts, definitions and classifications.

Three surveys conducted in 1981, 1986 and 1992 provide the data on time use. All three relied on the diary approach and have a fairly similar activity classification. The 1986 and 1992 surveys are the most comparable in terms of design, while the 1981 and 1992 surveys yield more comparable results. There is only limited information on unpaid work for 1971 and none for 1961. Time spent on unpaid work for these years is extrapolated from the 1981, 1986 and 1992 data.

3.1.4 Estimation formulas and statistics

The aggregate value of unpaid work is estimated as follows. The data entering the calculations are the number of people in each group 'g' (denoted by P_g), average annual hours spent on unpaid work activity 'a' by persons in group 'g' (denoted by $AHUW_{a,g}$), and the imputed hourly cost for unpaid work activity 'a' by persons in group 'g' (denoted by $C_{a,g}$).²

The total time spent on activity 'a' by all people in group 'g' ($HUW_{a,g}$) is equal to the number of people in the group multiplied by the average annual hours

they spent on it:

$$HUW_{a,g} = P_g \times AHUW_{a,g}$$

The value of the time spent on activity 'a' by all persons in group 'g' ($VUW_{a,g}$) is equal to annual hours multiplied by the relevant opportunity or replacement cost:

$$VUW_{a,g} = HUW_{a,g} \times C_{a,g}$$

The value of unpaid work undertaken by all persons in group 'g' (VUW_g) is obtained by adding the estimates for each type of unpaid work:³

$$VUW_g = \sum_a VUW_{a,g}$$

Last, the value of unpaid work (VUW) at the national level is obtained by adding the estimates for all groups:

$$VUW = \sum_g VUW_g$$

The general formula for estimating the value of unpaid work thus involves adding the value of all types of unpaid work for all groups:⁴

$$VUW = \sum_g \sum_a [P_g \times AHUW_{a,g} \times C_{a,g}]$$

The monetary value of, and hours spent on, unpaid work are calculated by group and by type of unpaid work. Results are expressed as aggregates, averages, shares or indexes.

Aggregates are the study's main statistic. It could be misleading, however, to compare them over time or

2. The subscripts 'a' and 'g' attached to the three variables represent different activities and groups (e.g., 'a' = 1 = meal preparation, 'a' = 2 = meal clean-up, and so on). To simplify the presentation, subscripts indicating years and valuation methods are omitted.
3. \sum_a denotes the summation of all activities indexed by 'a'.
4. The general formula to estimate VUW directly from the time use survey database (the approach taken in the study on the value of household work in 1992) is essentially the same. In this case, the summation is across all survey respondents, P_g is replaced with the weight of each respondent in the survey, $AHUW_{a,g}$ with the annualized time spent on each activity, and $C_{a,g}$ with an imputed cost which can be specific to each respondent.

between groups, because group size varies. Comparisons of averages and shares are more easily interpreted, as they are not affected by group size. Share statistics on the time spent on unpaid work are calculated for specific activities and groups. Activity shares over time are indicative of the demand for different types of unpaid work, while group shares serve to identify the disproportionate contribution of certain groups through a comparison with their population share.

Price indices are derived from aggregates in which hours of unpaid work are fixed at their level in 1986.⁵ Volume indices are derived from aggregates in which imputed costs are fixed at their rate in 1986. These indices serve to answer the hypothetical question of what would be the replacement cost of unpaid work in 1992, if people had the same activity patterns as in 1986. They are particularly useful for isolating the effects of costs, activity patterns and demographics on the value of unpaid work.

3.2 Population counts

There are three issues with respect to population counts: reliability and comparability of source data, coverage of the population and selection of groups for the purpose of analysis. The population counts are shown in Appendix Table A.1.

3.2.1 Data sources and procedures

The number of people in each group is taken from the 1961, 1971, 1981, 1986 and 1991 censuses. Counts for 1992 are projections from the 1991 census based on group-specific growth rates taken from Statistics Canada's Social Policy Simulation Database.

The census is undertaken every five years and constitutes a source of reliable, detailed and consistent information on the number of people in specific groups of the population. Nevertheless, it has some drawbacks for the purposes of this study. One of the key characteristics used to define groups of the population is labour force status, reported for the week prior to the census, usually the last week in May.

5. 1986 is chosen for the sake of consistency, as it is presently the reference year of the national accounts estimates at constant prices.

Consequently, seasonal employment has an effect on the count in each group.

Second, not all people are counted in the census and a small number are counted twice. In the 1991 census, for example, the net undercount (i.e., an estimate of people missed less those counted twice) is about 2.9 percent, just under 800,000 persons.⁶ The undercount has some effect on aggregates, but none on averages and shares.

3.2.2 Population coverage

The study covers all persons aged 15 and older in private households in Canada. Children under age 15, persons living in collective dwellings and foreigners residing temporarily in Canada are excluded.

Children under age 15 are excluded for a number of reasons. There is no information on the time they spend on unpaid work. Even if it were available or imputed somehow, valuation of children's unpaid work would remain problematic. It is not clear how to determine children's opportunity cost, given their limited opportunities for paid employment. Replacement costs are not readily applicable, since they are based on the earnings of adults. Last, including children under age 15 would preclude comparing the results with labour force statistics, which relate to persons aged 15 and over.

Persons living in collective dwellings include residents of hotels, motels, lodging and rooming houses, missions and hostels, orphanages, school residences, nursing homes, chronic care hospitals, psychiatric institutions, correctional and penal institutions, military bases, and so on. They are excluded due to a lack of information on their unpaid work and demographic characteristics. In any event, they represent a relatively small proportion of the population and the care and upkeep of the institutionalized population is only marginally provided through unpaid work.

6. The estimates of the total population are adjusted for net undercount, but the census database, used in the study, is not. See *The Daily*, Cat. No. 11-001E, September 16, 1993. Net undercount has risen from an estimated 1.6 percent in 1971, therefore marginally affecting results expressed in terms of levels and trends.

Table 3.1
Classification of Population Groups

Province or territory	Sex and family status	Number of children under age 19	Age of youngest child	Labour force status
Newfoundland	Wife	None	0-4 years	Employed
Prince Edward Island	Husband	One	5-18 years	Not employed ²
Nova Scotia	Female lone parent	Two or more		
New Brunswick	Male lone parent			
Quebec	Female child (15+)			
Ontario	Male child (15+)			
Manitoba	Female living alone			
Saskatchewan	Male living alone			
Alberta	Other female ¹			
British Columbia	Other male ¹			
Yukon and Northwest Territories				

Notes:

1. The category 'other' consists of persons not belonging to a census family in a household of two or more persons.
 2. The category 'not-employed' consists of persons who are unemployed or not in the paid labour force.

Foreigners with temporary residence in Canada refer to diplomatic and military personnel and visitors. They are left out from the census and the time use surveys. In addition, foreign diplomatic and military personnel ought to be excluded for consistency with national accounting conventions regarding production occurring in foreign embassies and military bases located in Canada.⁷

A number of changes to the census over the years result in some minor inconsistencies in the study's coverage. Canadian diplomatic and military personnel abroad are included in the study only in 1961 and 1971. Non-permanent residents (foreigners holding a student visa, an employment or a Minister's permit, and refugees) in private households belong to the study's population in 1992, but not in previous years.

7. Gross Domestic Product measures production occurring within Canada's boundaries, which encompass Canadian embassies and military bases abroad and exclude foreign embassies and military bases in Canada.

3.2.3 Population groups

Each person in the study's population is classified as belonging to a group, on the basis of province or territory of residence, sex, census family status, number of children and, if any, age of the youngest, and labour force status (see Table 3.1). There are 572 groups in all. For example, one of the groups is made up of employed wives in Quebec, with two or more children and whose youngest child is between 5 and 18 years old. Group selection is guided by considerations of relevance, reliability and comparability. Thus, sex and labour force status clearly influence the time spent on unpaid work, while place of residence has an effect on wage rates. Other factors such as age group or full-time versus part-time employment are also relevant to the analysis but consideration of reliability prevents subdividing the population any further.

'Census family' refers to a married or common-law couple with or without their never-married children, or a lone parent with at least one never-married child living in the same dwelling. Members of census families are either wives, husbands, lone parents or chil-

children. Wives, husbands and lone parents are further classified according to number of children and age of the youngest.⁸ Persons who do not belong to a census family are classified as living either alone or with others. Last, all persons are classified as either 'employed' or 'not employed' according to the 1971 census definition. They are employed if they do any work for pay or profit, any unpaid work for a family farm or business or are temporarily absent from work and not looking for another job. Otherwise, they are classified as not employed.

Several changes to the census over the years lead to minor differences in the classification of groups. Unrelated wards, foster and guardianship children under age 19 are treated as non-family persons beginning with 1981 and as children prior to that. Women working for a family farm up to 19 hours a week without pay are classified as not employed in 1961 and 1971, and as employed subsequently. Last, persons temporarily absent from work are classified as employed in 1961 but as employed in later years only if they are not looking for another job.

3.3 Time use

Another key requirement is data on the time spent on unpaid work by the various population groups. Considerations are essentially the same as for population counts: to obtain reliable, detailed and historically comparable information. Ideally, the information should pertain to the groups discussed in Section 3.2.3. Types of unpaid work should also be comparable over time, which involves matching them with the activity classification in the various time use surveys.

3.3.1 Data sources

There is little information on how Canadians, historically, have spent their time. Three surveys are available: the 1981 Canadian Time Use Pilot Study and the 1986 and 1992 General Social Surveys on Time Use.⁹ The surveys conducted in 1986 and 1992 are comparable in design. They also meet the study requirements, as respondents can be classified by family status, number of children, and so on.

8. Wives and husbands whose youngest child is aged 19 or over are grouped together with those with no children.

The most recent surveys are based upon a representative sample of the household population aged 15 and over in the ten provinces. There were 8,996 respondents to the 1992 survey, and 9,744 to the 1986 survey. The 1981 survey relied on a representative sample of the household population aged 15 and over in fourteen locations across the country and had 2,686 respondents.

All three surveys took the diary approach to record activities undertaken by each respondent on one day. Respondents were interviewed on different days to obtain results representative of the whole week. The 1992 survey covered all twelve months of the year to capture the seasonal variation in activities. The 1986 survey was conducted in November and December, and the 1981 survey, in September and October. Consequently, the 1981 and especially the 1986 data reflect seasonal patterns in unpaid work.

The 1986 and 1992 surveys contained questions on primary activity and the 1981 pilot survey, on both primary and secondary activity. Only primary activity is taken into consideration here. In all three surveys, respondents described their activities which were then coded. Appendix Table A.3 shows the concordance between types of unpaid work and the activities defined in the three time use surveys.

3.3.2 Procedures

Estimates for average annual hours spent on unpaid work (**AHUW_{a,g}**) in 1981, 1986 and 1992 are obtained as follows. Respondents are first assigned to groups on the basis of their characteristics.¹⁰ The time they report having spent on each type of unpaid work is multiplied by 365/60, to convert minutes per day into hours per year. The average time spent on each type of unpaid work is then calculated for each group. The 1981 and 1986 estimates for home repair, gardening and grounds maintenance and shopping are then adjusted for seasonality. The adjustment is calculated by sex from the 1992 data, as the annual average

9. See Statistics Canada, *General Social Survey, Cycle 7: Time Use, 1992 Public Use Microdata File*, 1993; *General Social Survey, Cycle 2: Time Use, Social Mobility and Language Use, 1986 Public Use Microdata File*, 1987; and Kinsley and O'Donnell, *Marking Time: Methodology Report of the Canadian Time Use Pilot Study - 1981*, 1983.

10. Labour force status cannot be precisely determined, thus each respondent is classified according to her (or his) main activity in the week prior to the survey (e.g., working at a job, looking for work, going to school, keeping house, etc.).

time spent on an activity divided by the average for September and October (for 1981) or November and December (for 1986). The imputation procedure adopted for 1961 and 1971 is discussed in Section 3.3.4.

Some respondents to the 1981 survey are not readily assigned to a specific group. The survey requested only limited information on household members other than the respondent, and none on relationships between household members. Wives, husbands and persons living alone are readily identified. The identification of lone parents, children and other persons in multi-person households, however, does not precisely follow the definitions of the census or subsequent time use surveys.¹¹ There are also difficulties in assigning parents with children at home to the proper group. Consequently, the 1981 data on the unpaid work of these groups are not fully comparable with those for subsequent years.

Purposive choice of locations in the 1981 survey resulted in a non-statistically representative sample. Fourteen locations were chosen from rural and urban areas and French and English-speaking communities: Vancouver, Calgary, Regina, Census Division 18 in Manitoba, Sudbury, Toronto, Montreal, Sherbrooke, Brome County in Quebec, Saint John, Halifax, Charlottetown, King's County in Prince Edward Island and St. John's. To improve the 1981 sample's representation, respondents are weighted to represent the other adults in the household, responding households, to represent other households in the same location and the chosen locations, to represent other locations within the same stratum.¹²

Unlike the counts of population groups, estimates of time spent on unpaid work are calculated at the national level only, for the 52 groups defined by sex, family status, number of children and if any, age of youngest, and labour force status. With a minimally reliable estimate requiring a group of at least 30 respondents, at least 17,000 respondents would be needed to estimate time use by province or territory in a given year, a number considerably larger than the sample, especially for 1981. Therefore, only popula-

tion counts and, later on, imputed values are established by province or territory of residence. Even at the national level, there are still some groups with few or no respondents to the time use surveys, most notably among the lone parent and not-employed husband categories. A different procedure is applied for these groups (see Section 3.3.4). Appendix Table A.2 shows the number of respondents in each group and the corresponding annual average hours of unpaid work.

3.3.3 Classification of unpaid work

The classification of unpaid work is guided by the application of the third person criterion and is not without difficulties. One problem that arises is that an activity may be identified in one survey, but not in another. For example, 'coaching' and 'home computer use' are newly identified activities in the 1992 survey. In these instances, the activities are excluded except when they fall in the major categories of 1) domestic work, 2) help and care and 3) management and shopping.

Some activities are made up of delegable and non-delegable sub-activities. Thus, 'political and civic activity' (activity 610 in the 1992 survey) includes: attending a meeting at City Hall, witnessing an accident, being on jury duty, going to court, watching a fire, attending a protest march, and so on. Watching a fire does not satisfy the third person criterion but being a juror does. All political, civic, professional and social activities are excluded because they cover an indeterminate mix of productive and non-productive activity. Other activities may not satisfy the third person criterion when considered in one context, and satisfy it in another. When 'waiting' for instance takes place during a sequence of events such as driving to a store, choosing items, making the purchase and driving back home, it is an integral part of shopping and treated as unpaid work.¹³

Personal care (grooming oneself, dressing) is excluded, although it sometimes meets the third person criterion.¹⁴ Receiving personal care (e.g., a

11. Children are defined as never-married respondents aged 15-18 and lone parents, as not-married respondents who are between 16 and 50 years older than the oldest child at home. Other persons are identified residually.

12. Three strata consisting of census sub-divisions and metropolitan areas with less than 10,000 households, between 10,000 and 90,000, and over 90,000 households are used.

13. This reveals an important practical problem with the third person criterion, namely, that the level of detail at which it is applied matters. Waiting episodes or short breaks are often integral to other broader activities and the question arises as to whether or not they should be viewed as part of the overall activity. See Frederick, *et al.*, "Measuring Unpaid Work: The Canadian Experience," 1992, p. 10.

Table 3.2

Classification of Unpaid Work

Type of unpaid work	Examples
Domestic work	
Meal preparation	
1. Preparing food or meals	Making a pot of tea; setting the table; making and serving dinner; preparing lunches and snacks; cooking; baking; preserving foods; and home brewing.
2. Food or meal clean-up	Cleaning up after meals or baking; washing and drying dishes; stacking them in the dishwasher; putting food and utensils away; wiping counter or stove.
Cleaning	
3. Cleaning	Mopping floors; dusting and vacuuming; making beds; washing windows; picking things up; reorganizing cupboards; taking out garbage; shovelling snow; cleaning the garage; cleaning windows; sweeping the driveway.
Clothing care	
4. Laundry and ironing	Washing; hanging wash out to dry; ironing; folding clothes and linen.
5. Clothes repair and shoe care	Mending clothes; removing stains; sewing on buttons; hemming; treating leather; repairing and shining shoes.
Repairs and maintenance	
6. Home repairs and maintenance	Interior or exterior painting; plastering a wall; plumbing; doing electrical rewiring; replacing shingles; caulking; repairing household equipment; fixing or washing the car; repairing a bicycle; renovating the dwelling or garage.
7. Gardening and grounds maintenance	Flower and vegetable gardening; mowing and watering grass; weeding; composting; raking leaves and trimming hedges; watering house plants; cleaning the pool.
Other domestic work	
8. Pet care	Feeding and grooming pets; taking the dog for a walk; replacing litter; cleaning an aquarium.
9. Other domestic work, n.e.c.	Packing for a move or vacation; rearranging furniture; putting groceries away; preparing a spare room for visitors; making cigarettes.
Help and care	
Child care	
10. Physical care - children	Feeding, nursing, changing and bathing babies; putting them to sleep; doing housework related to babies such as preparing baby formulas, washing diapers and baby clothes; feeding, dressing and bathing other children; putting them to bed; packing school lunches.
11. Education - children	Teaching children to learn, fix or make things; helping with school work and projects; reprimanding; reading and talking to children.
12. Medical care - children	Administering first-aid, medicines or shots; taking temperature; tending to a sick child; waiting for children to be admitted to hospital.
13. Other care - children	Playing games with children; walking or biking with them; unpaid baby-sitting by household members (not parents or guardians); visiting children in hospital.
Adult care	
14. Personal care - adults	Washing and cutting hair; running a bath; helping someone to put on clothes; providing non-medical help to disabled and elderly adults of the household; visiting them in hospital.
15. Medical care - adults	Administering first-aid; preparing and administering medicines; taking temperature; providing medical care to sick or disabled adults.
Management and shopping	
16. Household management and administration	Paying bills; balancing checkbook; making shopping list; planning meals; doing tax returns; making insurance claim; buying stamps and mailing letters; obtaining and renewing licenses; consulting with professionals (e.g., lawyer, architect).
17. Shopping for goods and services	Shopping for groceries, clothing, hardware, gasoline, furniture, car, etc.; picking up take-out food; looking for a house or apartment; taking automobile to the garage; getting appliances repaired; waiting in line for purchases.
Transportation and travel	
18. Transport - children	Taking children places (e.g., school, day care, doctor's office, etc.).
19. Transport - all other household work	Travel related to management and shopping for goods and services; taking household adults to work, school, hospital, and other places; other travel related to domestic work (e.g., take garbage to the dump).
Other unpaid work	
20. Volunteer work	Fund raising; answering a crisis line; delivering meals; doing clerical work; attending meetings; helping at soup kitchen.
21. Other help and care	Helping friends, neighbours, relatives and others with housework, cooking, transportation, repairs and maintenance; looking after a neighbour's child; tending to a sick friend.
22. Transport; other unpaid work	Travel related to volunteer work and other help and care.

haircut, massage or medical and dental treatment) is excluded as well. Unlike self-administered personal care, received personal care does not satisfy the third person criterion.

The classification of unpaid work adopted here is based upon activities common to all three time use surveys, often those of the least detailed survey, to avoid having to split an activity into sub-activities. When an activity needs to be split for the sake of valuation at replacement cost, it is done in proportion to the time spent in 1992. Table 3.2 shows the levels of classification and the types of unpaid work. There are 22 categories at the most detailed level, at which all calculations are done. Results, however, are shown only for the intermediate level.

The study's classification of unpaid work differs from those of the time use surveys in two main respects. Household administration (paying bills, preparing a tax return, etc.) belongs to 'management and shopping' instead of 'domestic work'. 'Travel and transport' is classified according to whether it is done for members of the household or on behalf of other households and volunteer organizations.

3.3.4 Imputation of unpaid work

Since there is no information on Canadians' unpaid work in 1961 and 1971, imputations are required. Time spent on unpaid work in these years is extrapolated from the 1981, 1986 and 1992 survey results, the assumption being that change between 1981 and 1992 is indicative of the one between 1961 and 1981. This seems reasonable since the variation in time spent on unpaid work between 1981 and 1992 is not very large compared to that across demographic groups.

The imputation is made as follows. The trend in unpaid work (i.e., the average annual change in the total hours of work between 1981 and 1992) is calculated for each group.¹⁴ For groups with 60 respondents or more, mostly those of wives, employed husbands, children, people living alone and other persons, this trend is then extrapolated backward

from the 1981 survey estimate. For groups with fewer than 60 respondents, mostly those of lone parents and not-employed husbands, the trend is extrapolated backward to 1961 and forward to 1992 from a 1986 level equal to the time spent on unpaid work averaged across the three surveys.¹⁶ In either case, the annual change is constrained to be within plus or minus 0.5% of the benchmark estimate. In other words, time spent on unpaid work for 1961 can deviate by no more than plus or minus 10% from the 1981 benchmark or 12.5% from that of 1986. The same procedures are then applied for each of the 22 types of unpaid work.¹⁷ The resulting estimates are then scaled to sum to the totals established for all unpaid work.

3.4 Valuation

The valuation of unpaid work involves deriving wage-based imputed costs, expressed at hourly rates, in a manner consistent with each method. For the opportunity cost method, one cost applies to unpaid work as a whole and it varies by province and sex. For replacement cost, a cost varying by province is assigned to each type of unpaid work, on the basis of the hourly earnings in a specific occupation. The opportunity and replacement costs are shown in Appendix Table A.4.

3.4.1 Data sources and procedures

The data come from the census and calculations are done for groups defined by province and, depending on the method, by sex or by occupation (i.e., type of work). Estimates of average hourly earnings are calculated as total annual employment income divided by total annual hours of work. The latter is the product of weekly hours by weeks worked during the year for each person, summed over all persons in the group. For groups of fewer than 30 persons, average hourly earnings of the group in the region are used instead (e.g., the Atlantic provinces for Newfoundland).

14. Chadeau discusses self-administered personal care in her survey article "What is Households' Non-Market Production Worth?" *OECD Economic Studies*, 1992.

15. It should be noted that the procedure assigns little weight to the 1986 data, so that little seasonality is carried back to the 1961 and 1971 data.

16. Averaging across the three surveys, in the case of small groups, increases the reliability of the benchmark estimate, from which the extrapolation is made.

17. For some groups and activities representing about 2% of all cases, these procedures result in negative values which are set to zero.

The estimation of hourly earnings poses a number of problems. First, hours of work relating to the week preceding the census have to be taken as an approximation of average weekly hours during the year. Weeks worked and employment income, on the other hand, relate to the calendar year prior to the census. Weeks worked are taken as reported in the census, but annual employment income is indexed for the inflation between the reference year, 1985 in the 1986 census for instance, and the census year itself.¹⁸ Last, some people are employed, but absent from their job at the time of the census and report no hours of work for the reference week. They are retained in the calculations, so their annual employment income is included in the total but no hours of work are attributed to them. This has the effect of converting their employment income into a premium on hourly earnings for the group (e.g., for paid absences).

The procedures are somewhat different for 1961 and 1971. The 1971 calculations are based upon the midpoints of ranges of annual weeks and weekly hours of work (e.g., 1-13 weeks, 14-26 weeks, etc., 1-19 hours, 20-29 hours, etc.) and pertain to usual, instead of actual weekly hours. Estimates of average hourly earnings for 1961 are derived from the 1971 estimates, corrected for the increase in nominal wages over the decade.

3.4.2 Opportunity cost

For the opportunity cost method, average hourly earnings are based on the employment income of persons aged 15 and over, who were employed at the time of the census and had worked the previous year. This is a broadly defined group, covering employees and the self-employed in all industries, in all occupations, managerial and non-managerial, and working full- and part-time and full- and part-year.

The adjustments for social security contributions rely on different assumptions depending upon the method. With the before tax variant, it is assumed that the opportunity cost, from society's perspective, includes the forgone employer contributions associated with the forgone employment earnings. Or else, from the household perspective, it is assumed that households perceive benefits equivalent to the contri-

butions employers would make on their behalf. For the after tax variant, it is assumed, again from the household perspective, that opportunity costs are equivalent to the take-home pay. No adjustment is needed for employers' contributions and those of employees are netted out.

The ceiling on earnings subject to contributions complicates this adjustment. If employment income exceeds the ceiling, neither the employee nor the employer is required to make further contributions. In this case, the marginal contribution rate is zero. Thus, if the average annual employment income is at or above the maximum pensionable or insurable earnings, no adjustment is required. Otherwise, the adjustment to average hourly earnings is equal to the legislated contribution rate for employers and employees. The effect of these adjustments on the results is explored further in Section 4.3.2.

Finally, opportunity costs after tax are net of the marginal income tax, established as follows. The average taxable income by province and sex is derived as the total taxable income divided by the number of tax returns, as reported by Revenue Canada. The average hourly earnings are then reduced by an amount equivalent to the combined federal and provincial marginal taxes applicable at the level of average taxable income, again by province and sex.¹⁹ These marginal tax rates reflect a variety of federal and provincial surtaxes and reductions in effect at various thresholds of taxable income. Their main drawback is that they apply to single taxpayers with no dependants and likely over-estimate the tax rates to which other taxpayers are subject.

3.4.3 Replacement cost

Replacement costs are based on the employment income of all persons aged 15 and over who were employed at the time of the census and had worked full time throughout the previous year. This is done to improve estimates of earnings by occupation. The employment income of persons working full time is more representative of the average earnings in their occupation.

18. The adjustment is based on a fixed-weighted hourly earnings index after 1984 and on average weekly earnings prior to that. For the last year under study, the adjustment is made for inflation from 1990 to 1992.

19. Due to lack of information, the marginal tax adjustment for 1961 is based upon information for 1963. For 1992, the adjustment is made in a similar fashion, but on the basis of average assessed income and tax tables giving combined federal and provincial marginal tax rates by level of assessed income.

In several studies, separate replacement costs are calculated by sex (see Section 5.3.2). Here, a single replacement cost is calculated for women and men. It includes earnings plus an estimate of the employers' effective social contributions. Although there is only one legislated contribution rate, the effective rate varies depending on the average annual employment income by province and occupation. The 1971 *Standard Occupational Classification* is used throughout to facilitate comparisons.

A key step with the replacement cost method is to choose occupations corresponding as closely as possible with various types of unpaid work. Since the classification of occupations is designed to categorize paid work, often quite different from unpaid work, this is not straightforward either with the specialist or the generalist variant, but the difficulty is greater with the former. Even an occupation generally similar to a specific type of unpaid work often covers a variety of paid jobs, some of which bear little resemblance to the work done by households. For instance, 'personal services' (category 6149) covers, among other tasks, housekeeping and attending to personal needs of the elderly or physically disabled. These jobs can be viewed as market substitutes to 'domestic work' and 'help and care' to household members. However, the category also includes tattoo artists.²⁰ In practice, some abstraction from the underlying details is needed.

Two rules govern the selection of occupations. First, the occupations to be chosen are the ones directly affected by an increased demand when a particular type of unpaid work is transferred to the market. And second, among these occupations, the one deemed the most similar to the type of unpaid work under consideration should be chosen. Both rules must be satisfied if the imputed replacement cost is to be meaningful, that is, convey information on household behaviour and on the interdependency between the market and non-market sectors. In some instances, they are difficult to apply. Thus, it is not clear which occupations would be affected if 'shopping' were transferred to the market. In this case, only the second rule is applied, and an occupation that entails tasks similar to 'shopping' is chosen.

Replacement costs can be based on the average earnings of one or several occupations. The first approach is taken here. As mentioned above, an

occupation can cover a variety of jobs, some of which bear little similarity to unpaid work. Basing replacement costs on the earnings of a group of occupations only compounds the problem. Such estimates are nevertheless calculated, as in earlier Statistics Canada studies (see Section 4.3.2). In this case, average earnings are weighted according to the employment in each occupation within the group.²¹

For the specialist variant, each type of unpaid work is matched with a specific occupation, with 17 occupations in all for the 22 types of unpaid work (see Table 3.3). For the generalist variant, all types of unpaid work except the broad categories of 'child care' and 'other unpaid work' are matched to personal service occupations (6149), 'child care', to child care occupations (6147) and 'other unpaid work', to the same occupations as with the specialist variant. For both variants, an upward adjustment of 15% is made to hourly earnings in personal service and child care occupations to account for board and lodging.

3.5 Differences with past studies

The population coverage is essentially the same here as in the 1986 and the 1992 studies. It has been extended to children aged 15 and over and non-family persons in family households for 1961, 1971 and 1981, and to the Yukon and Northwest Territories for 1961 and 1971. The population groups are fewer and somewhat different than in the past. Labour force status is now used to define all groups, not only wives and female lone parents. Husbands are no longer classified by their spouses' labour force status. Finally, there are only two categories for the number of children and the age of youngest, against three in previous studies.

Whereas earlier studies dealt exclusively with household work, this one also covers help and care of friends, relatives and neighbours, formal volunteer work and any related travel. The classification of unpaid work is more detailed than in previous studies,

20. The inclusion of tattoo artists makes no difference as their number is negligible.

21. This procedure is not entirely satisfactory. Let us assume that 'clothes repair and shoe care' is matched with 'tailors and dressmakers' and 'cobblers and shoe-shiners' and that households turn increasingly to the market for the care of footwear, creating jobs for cobblers and shoe-shiners. The procedure would attach more weight to shoe repairing and less to clothing care, when exactly the opposite is required.

Table 3.3
Occupations Matched to Unpaid Work

Type of Unpaid Work	Occupation ¹	Shortened description
1. Food or meal preparation	6121 Chefs and cooks	Planning menus; ordering supplies; preparing and cooking foods in hotels, restaurants, clubs, private households, etc.
2. Food or meal clean-up	6125 Waiters, hostesses and stewards	Arranging dining room tables; greeting and seating customers; serving food and beverages in hotels, clubs, restaurants, etc.
3. Cleaning	6191 Janitors, charworkers and cleaners	Cleaning building interiors and furnishings; washing windows; performing minor painting, plumbing and carpentry work, etc.
4. Laundry and ironing	6162 Laundering and dry cleaning occupations	Washing, drying and dry cleaning garments, furs, rugs and textile furnishings in a commercial establishment.
5. Clothes and shoe repair	8553 Tailors and dressmakers	Making made-to-measure garments and altering and repairing articles of clothing such as suits and dresses.
6. Home repairs and maintenance	8798 Labourers and elemental workers in construction	Labouring or other elemental work related to the erection, repair and maintenance of buildings and other works.
7. Gardening and grounds maintenance	7195 Nursery and related workers	Growing and primary marketing of trees, shrubs and ornamental plants and providing landscaping, grounds-keeping and gardening services.
8. Pet care	7199 Other farming, horticultural and animal husbandry occupations	Occupations related to farming, horticulture and animal husbandry.
9. Other domestic work, n.e.c.	6149 Personal service occupations, n.e.c.	Providing other personal services such as housekeeping, attending to personal needs of employer, acting as companion, etc.
10. Physical care - children	6147 Baby-sitters	Caring for children in private residences during the temporary absence of parents or guardians.
11. Education - children	2731 Elementary and kindergarten teachers	Teaching at an elementary level reading, writing and arithmetic; teaching songs, games and simple tasks.
12. Medical care - children	3134 Nursing assistants	Giving routine nursing care such as taking temperature, pulse and blood pressure; feeding and bathing patients.
13. Other care - children	6147 Baby-sitters	See line 10.
14. Personal care - adults	3135 Nursing aides and orderlies	Providing auxiliary services to patients, such as answering bells, serving food trays, adjusting beds and other routine tasks.
15. Medical care - adults	3134 Nursing assistants	See line 12.
16. Management and administration	1142 Services management occupations	Doing managerial and administrative work in service establishments.
17. Shopping for goods and services	1175 Purchasing officers and buyers	Buying goods or materials for internal use or for further processing in establishments where the items purchased are not for resale.
18. Transport - children	9173 Taxi drivers and chauffeurs	Operating a taxi or an automobile to transport passengers.
19. Transport - all other household work	9173 Taxi drivers and chauffeurs	See line 18.
20. Volunteer work	2333 Occupations in welfare and community services	Performing tasks similar to those of a social worker in a non-professional capacity, such as organizing non-profit activities in youth clubs, community centres and similar organizations.
21. Other help and care	6149 Personal service occupations, n.e.c.	See line 9.
22. Transport: other unpaid work	9173 Taxi drivers and chauffeurs	See line 18.

Note:

1. Dominion Bureau of Statistics, *Occupational Classification Manual, Census of Canada 1971*, Cat. No. 12-536, 1971.

except the one carried out for 1992. Twenty-two types of unpaid work are valued separately in this study against eight or nine broad types of household work for the 1961, 1971, 1981 and 1986 studies and 44 types of household work in the 1992 study. Estimates of time spent on unpaid work for 1961 and 1971 are now extrapolated on the basis of more recent time use surveys, while they were originally based on data on wives' and husbands' household work taken from surveys conducted in Halifax and Toronto in 1971.

Previous studies adopted the replacement cost (specialist) method and all but the 1981 study applied the after tax variant of the opportunity cost method. The 1971 study used the generalist variant of replacement cost as well, while the 1981 and 1992 studies, opportunity cost before tax. None made any adjustment for employers' and employees' social security contributions. Opportunity costs are based upon the earnings of all persons employed at the time of the census, as in the 1986 and 1992 studies. Earlier, they were based upon the earnings of persons employed full-year, full-time.

The replacement cost varied by type of unpaid work, province and sex in the 1961, 1971 and 1981 studies, and subsequently, only by type of unpaid work and province. Finally, in contrast with earlier studies, the replacement cost for each type of unpaid work is now based on the earnings in a single occupation.

4 Results

As with the concept, definition and measurement of unpaid work, its analysis is not straightforward. There is a variety of dimensions in which the estimates can be explored, for example, by region, demographic group or activity, in current or constant prices, and by valuation method. The discussion, however, addresses a limited number of questions.

How large is the household economy in relation to the market economy and how has its relative size changed over time? It is fairly common to address this question by comparing the value of unpaid work (VUW) with GDP, even though most would agree that this can be misleading. In particular, it leads to the seemingly paradoxical conclusion that the household economy is smaller than the market economy, even though more time is spent on production in the former. However, VUW and GDP are not really comparable. GDP is a measure of production, while VUW measures only the labour inputs into household production. Moreover, GDP is measured at market prices¹ and thus includes indirect taxes, which are not levied on unpaid work, nor included in the estimation of its dollar value.

The comparison of VUW and GDP gives only one perspective on the relative size of the household economy. Other comparisons are made with GDP at factor cost, labour income and personal expenditure on goods and services. The same comparisons are presented for each valuation method, although in some instances this may be inappropriate. Thus, if VUW at opportunity cost is interpreted as a measure of income forgone, it seems preferable to compare it with an income aggregate. Likewise, it seems more appropriate to compare VUW at replacement cost with an expenditure aggregate.

What is the impact of incorporating unpaid work in measures of economic growth? This question is difficult to answer, as the relationship between the time inputs into household production and the output is unknown. It is important to take household productivity into account, however, so an assumption has to be made.² In some studies, the growth of GDP plus VUW at current prices is compared with that of GDP alone. In others, VUW is expressed at constant prices by deflating it with the implicit price index for GDP,

1. Unless stated otherwise, GDP means GDP at market prices.

personal expenditure, or personal expenditure on services. In all cases, some implicit assumption is made about productivity. The approach taken here is to derive the VUW at 1986 prices under each valuation method (assuming zero productivity growth) and then to adjust it explicitly for household productivity. The results indicate that the 'bias' in measured growth is smaller on the assumption of moderate gains in household productivity. They also suggest some counter-cyclicalities in unpaid work.

What is women's contribution to unpaid work and how has it changed over time? The question ought to be addressed both in volume (i.e., time) and value terms, as the two measures yield different results. Women's contribution is substantial and greater than men's, both in volume and in value. Over time however, there is a slight decline in women's share of unpaid work, more notably in terms of volume.

Whether unpaid work, on average, has increased or decreased in past decades is a subject of debate.³ Results of this study shed some light on the issue but should be interpreted with some caution because time spent on unpaid work is extrapolated for 1961 and 1971. On average, women are spending less time on unpaid work, men are spending slightly more, and change tends to be gradual. There is, on average, a decline in time spent on unpaid work, due primarily to change in the composition of the population. However, after correction for compositional change, the results indicate that the time spent on unpaid work per person has increased.⁴

Finally, the results are contingent upon the underlying data and procedures and a question arises as to their robustness. Several tests are undertaken to examine the effect on the results of change in the female-male wage gap, in activity patterns as well as in income taxes and social security contributions, among others.

2. In a study for West Germany, Schettkat finds that the household sector grows relative to the market sector, on the assumption of equal productivity growth. The reverse is true under the assumption of no gains in household productivity. See "The Size of Household Production: Methodological Problems and Estimates for the Federal Republic of Germany in the Period 1964 to 1980," *Review of Income and Wealth*, 1985, p. 318.
3. See Juster and Stafford, "Changes over the Decades in Time Spent at Work and Leisure: An Assessment of Conflicting Evidence," 1992.
4. Technological progress and changing attitudes toward unpaid work presumably have had some effects, but they are not readily assessed.

4.1 Summary results

This section discusses the results by valuation method and compares them with various indicators of the market economy. It also looks at other aspects of unpaid work, such as regional variation, women's contribution and the variation due to employment and the presence of children. Some broader measures of economic growth are examined as well. Summary statistics and detailed aggregates can be found in Appendix Tables B.1-B.5 and C.1-C.5.

4.1.1 Valuation methods compared

There is considerable variation in the estimates of unpaid work, as seen in Table 4.1. The difference between the lowest and the highest estimates in 1992, for instance, is \$153 billion, or 22% of GDP. There are noticeably divergent trends as well. The difference between the after tax and before tax opportunity cost estimates is getting larger, with the latter rising steadily in relation to the former. The replacement cost (specialist) estimate on the other hand generally declines against the before tax opportunity cost estimate, but increases *vis-à-vis* the after tax estimate. The replacement cost (generalist) estimate rises against the other three.

Table 4.1
Value of Unpaid Work by Method

	Opportunity cost		Replacement cost	
	Before tax	After tax	Specialist	Generalist
	billions of dollars			
1961	26.0	21.4	22.7	14.0
1971	56.0	39.4	48.8	29.7
1981	169.6	111.5	140.7	91.0
1986	225.5	141.4	189.7	132.3
1992	374.1	221.1	296.6	234.5

Is the foregoing a comparison between 'apples and oranges'? As noted in Section 2.5, the different methods really measure the value of unpaid work from different perspectives. Nonetheless, the comparison reveals the impact of the choice of method on the results. The choice of method has some less obvious consequences. Thus, a change in the division of meal preparation between the sexes, with men doing more, has no effect on VUW at replacement cost, but raises VUW at opportunity cost. Conversely, a reallocation of time from activities with a low replacement cost to those with a high one raises

VUW at replacement cost, but has no effect on VUW at opportunity cost.

4.1.2 Comparison between household and market sectors

The estimates of the value of unpaid work are compared to four key economic aggregates in Table 4.2: (1) Gross Domestic Product at market prices, (2) Gross Domestic Product at factor cost, (3) labour income, and (4) personal expenditure on goods and services. A few salient points emerge from the comparisons.

Table 4.2
Ratios of VUW to Selected Aggregates

	Opportunity cost		Replacement cost	
	Before tax	After tax	Specialist	Generalist
percent				
GDP at market prices				
1961	63.6	52.4	55.6	34.2
1971	57.5	40.5	50.1	30.5
1981	47.6	31.3	39.5	25.6
1986	44.6	28.0	37.5	26.1
1992	54.2	32.0	43.0	34.0
GDP at factor cost				
1961	72.0	59.3	63.0	38.7
1971	65.6	46.3	57.2	34.8
1981	53.1	34.9	44.0	28.5
1986	49.9	31.3	42.0	29.3
1992	61.8	36.5	49.0	38.7
Wages, salaries and supplementary labour income				
1961	122.7	101.2	107.3	66.0
1971	104.1	73.4	90.7	55.2
1981	85.7	56.4	71.1	46.0
1986	82.1	51.5	69.0	48.1
1992	95.5	56.5	75.7	59.9
Personal expenditure on goods and services				
1961	99.1	81.7	86.7	53.3
1971	99.4	70.1	86.7	52.7
1981	86.5	56.9	71.7	46.4
1986	75.8	47.5	63.8	44.5
1992	88.5	52.3	70.2	55.5

Regardless of the valuation method or the type of comparison, the production, consumption and forgone income and expenditure associated with households' unpaid work are substantial. Given that virtually all adults do unpaid work, but less than two-thirds are engaged in paid labour, this is no surprise. The opportunity cost before tax method yields the highest estimate of VUW, representing 54% of GDP, 62% of GDP at factor cost and 96% of labour income in 1992. On a replacement cost (generalist) basis,

VUW amounts to 34% of GDP, 39% of GDP at factor cost and just over one half of personal expenditure on goods and services in 1992. The estimate obtained with this method is typically the lowest, except for 1992, when the opportunity cost after tax estimate is marginally lower.

The results reveal a relative decline of VUW from 1961 to 1992. The decline of VUW at opportunity cost after tax, from 52% of GDP in 1961 to 32% by 1992, is most noticeable. It reflects the increase in the marginal tax rate and, to a lesser degree, in employees' social security contributions. The decline of VUW at opportunity cost before tax and replacement cost (specialist) is less pronounced, 9% and 13% of GDP, respectively. VUW at replacement cost (generalist) rises against personal expenditure on goods and services, but, in relation to GDP, it is about the same in 1992 as in 1961. This is largely the result of an above average wage increase in personal service and child care occupations, particularly since 1981.

The most pronounced relative decline of VUW occurred over the sixties and seventies. These decades witnessed rapid economic growth, characterized by substantial gains in employment, productivity and real income. The overall employment to population ratio rose from 49% in 1961 to 59% in 1981, with most of the increase attributable to women, whose employment to population ratio almost doubled, from 25% to 47%. On average, women who are employed spend about two-thirds as much time on unpaid work as those who are not (see Section 4.2.2). Consequently, the increase in women's employment has slowed the increase of VUW.

Between 1981 and 1986, all estimates of VUW, except that of replacement cost (generalist), exhibit a relative decline, although less pronounced than in the past. The trend is reversed however in 1992, with a marked increase of VUW. The general economic climate of the eighties and early nineties was considerably different than that of the previous two decades. Employment and GDP growth slowed significantly, growth in productivity and real income virtually stalled, and there were deep recessions, one in the early eighties and the other in the early nineties. The overall employment to population ratio stood at 59% in 1986 and 1992, the same as in 1981. Women have continued to join the labour force, but at a slower pace. Their employment to population ratio rose just over two points to 49% from 1981 to 1986 and by

another three points from 1986 to 1992. Men's employment to population ratio, which had been fairly stable in the sixties and seventies, declined between 1981 and 1992, from 72% to 66%.

Table 4.3
Hours of Unpaid Work

	1961	1971	1981	1986	1992
Hours of unpaid work (millions)	14 709	17 519	21 386	21 511	25 064
As a percent of hours of paid work	122.5	120.7	116.0	110.7	123.3
Job equivalents (millions) ¹	7.5	8.9	10.9	11.0	12.8

Note:

1. On a full-year full-time basis (49 weeks, 40 hours a week).

Table 4.3 shows hours of unpaid work and some related statistics. In the aggregate, between 10% and 24% more time was spent on unpaid work than on paid work in the years under study. There are some indications of counter-cyclicity in unpaid work, such as the relative decline in hours spent on it during the expansionary sixties and seventies. Hours of unpaid work were only marginally higher in 1986, when the economy was in the midst of an expansion, than in 1981, when it went into recession. They increase significantly in 1992, a period of protracted slow growth and of decline in real family income which began with the 1990 recession.

Table 4.4
Selected Ratios of Spending to the Value of Unpaid Work at Replacement Cost (Specialist)

Market substitute	Type of unpaid work	1961	1971	1981	1986	1992
percent						
Food services	Meal preparation	24.5	28.5	38.5	47.4	44.5
Laundry and dry cleaning	Clothing care	20.0	14.4	10.5	10.2	9.4
Child care outside the home ¹	Child care	1.5	1.5	3.8	8.6	10.8

Note:

1. Includes subsidies for day care expenses.

It is equally interesting to compare spending on similar market and unpaid services. Table 4.4 shows the ratios of spending on market services to the value of similar types of unpaid work. It indicates that there has been a transfer to the marketplace in the case of

child care and meal preparation. Spending on child care outside the home, for example, represents only about 2% of the value of child care at replacement cost (specialist) in 1961, but 11% in 1992. Clothing care, on the other hand, displays the opposite trend, with spending on laundry and clothing services declining against the replacement cost of clothing care at home.

4.1.3 Regional variation in unpaid work

Statistics at the national level mask considerable variation by region. Despite the use of national averages for time spent on unpaid work, the estimates are still influenced by provincial differences in the demographic structure, the employment to population ratio and wages. Table 4.5 shows VUW relative to GDP by region.

Table 4.5
Ratio of VUW to GDP by Region

Region		Opportunity cost		Replacement cost	
		Before tax	After tax	Specialist	Generalist
percent					
Atlantic	1961	84.1	71.5	72.6	37.3
	1971	71.9	51.9	62.3	31.5
	1981	68.5	46.4	54.8	34.0
	1986	58.8	37.4	47.5	35.0
	1992	69.3	43.2	52.5	39.7
Quebec	1961	68.4	56.1	59.4	34.9
	1971	63.7	44.8	55.7	32.2
	1981	59.2	35.7	47.2	28.2
	1986	51.9	29.1	43.3	31.2
	1992	60.9	32.6	48.7	36.6
Ontario	1961	58.5	48.1	50.3	31.4
	1971	53.3	37.7	45.5	28.0
	1981	45.5	31.0	37.5	24.4
	1986	40.3	26.0	33.7	22.5
	1992	52.4	32.2	41.8	33.0
West	1961	63.9	52.6	57.7	38.2
	1971	57.0	39.8	51.2	33.6
	1981	39.5	26.7	34.6	23.9
	1986	42.1	28.0	36.5	25.6
	1992	49.2	29.5	38.8	32.6

As in previous studies, the ratio of VUW to GDP tends to be well above the national average in the Atlantic Provinces and, to a lesser degree, in Quebec, reflecting the lower rate of employment in these regions. The converse is true in Ontario, where the employment rate is typically above the national average.

The ratio of VUW to GDP across the regions exhibits the same trend as nationally, namely a steady decline from 1961 to 1986 and an increase in 1992, for all but the replacement cost (generalist) method. In contrast to that of other regions, the ratio of VUW to GDP for Western Canada is greater in 1986 than in 1981. Severe droughts on the Prairies and the collapse of oil prices on world markets dealt a severe blow to the economies of Saskatchewan and Alberta during the mid-eighties. The increase of the ratio of VUW to GDP in these two provinces more than offset the decline in the rest of the region (see Appendix Tables B.1 to B.5).

4.1.4 Women's contribution

Women undertake the larger share of unpaid work (see Table 4.6), an estimated 68% (amounting to 10 billion hours) in 1961 and 65% (16 billion hours) in 1992. This represented between \$9 billion and \$15 billion in 1961 (23% to 36% of GDP), depending on the valuation method. For 1992, its estimated value ranges between \$133 billion and \$218 billion (19% to 32% of GDP, down somewhat from 1961).

Table 4.6
Unpaid Work of Women

	Number	Opportunity cost		Replacement cost	
	of hours	Before tax	After tax	Specialist	Generalist
	billions	billions of dollars			
1961	10.0	14.9	12.4	14.9	9.4
1971	11.8	32.6	23.1	31.8	19.9
1981	14.2	99.6	64.2	90.7	60.4
1986	14.6	137.3	86.2	124.5	89.7
1992	16.3	217.6	133.4	188.0	152.3
percent share of the total					
1961	67.8	57.3	57.9	65.3	67.5
1971	67.5	58.2	58.5	65.2	67.2
1981	66.6	58.7	57.6	64.5	66.3
1986	68.2	60.9	61.0	65.6	67.8
1992	65.3	58.2	60.3	63.4	65.0

Even though women have joined the work force in greater numbers since the early sixties, their share of hours of unpaid work remains quite stable, at about two-thirds of the total. Women's share of the value of unpaid work is less than their share in terms of hours, with noticeable differences between valuation methods. Their share of VUW at opportunity cost (before or after tax) is significantly less than their share of hours, reflecting their lower wages (see Section 4.2.3), and does not decline over time, due to

the narrowing of the female-male wage gap. In contrast, women's share of VUW at replacement cost is closer to their share of hours. The small difference here arises from the types of unpaid work that women and men do and from the variation in replacement cost by activity. Women tend to spend more time on tasks with a low replacement cost. This effect is more evident with the specialist than the generalist variant, because there is more variation in the replacement costs with the former.

Estimates per person provide another perspective on women's contribution. On average, at current replacement cost, the unpaid work done by women is valued annually between \$13,830 and \$17,090 in 1992. For comparison, the unpaid work done by men, on average, is valued at several thousand dollars less, between \$7,790 and \$10,310 a year. As can be seen in Table 4.7, the comparable figures range between \$18,320 and \$22,540 for women with children and are substantially less, between \$11,580 and \$14,350, for women without children.

Table 4.7

Average Value of Unpaid Work of Women, at Replacement Cost

		Specialist		Generalist	
		Without	With	Without	With
		children	children	children	children
dollars per year					
Females	1961	1 865	3 204	1 153	2 072
	1971	3 288	5 627	2 013	3 595
	1981	7 754	12 836	5 074	8 694
	1986	10 388	16 422	7 425	11 926
	1992	14 342	22 534	11 586	18 322
Wives	1961	2 374	3 208	1 500	2 078
	1971	4 218	5 640	2 631	3 611
	1981	9 700	12 962	6 458	8 815
	1986	13 100	16 779	9 459	12 191
	1992	17 317	22 792	14 231	18 589
Employed	1961	2 037	2 665	1 253	1 709
	1971	3 451	4 616	2 112	2 930
	1981	7 526	10 588	4 977	7 208
	1986	9 328	13 930	6 613	9 942
	1992	12 478	18 828	10 289	15 431
Not employed	1961	2 477	3 306	1 575	2 145
	1971	4 683	6 114	2 945	3 926
	1981	11 462	15 216	7 660	10 342
	1986	16 245	20 425	11 832	15 068
	1992	21 859	30 025	17 931	24 351

Wives undertake a disproportionate share, over 70%, of the unpaid work done by women. This share has declined, however, due to their declining share of the population, a greater increase in employment than

among women in general and an increasing proportion of wives without children (from 33% in 1961 to 52% in 1992). Table 4.7 illustrates the effect of employment on the value of unpaid work of wives with and without children. In 1992, for instance, the value of unpaid work at replacement cost for not-employed wives with children ranges between \$24,350 and \$30,030; for their employed counterparts, it is about \$10,000 less.

4.1.5 Economic growth

Economic growth is measured by the change in GDP at constant prices (that is, adjusted for inflation) from one period to the next. By this measure, the economy grew at 3.9% a year, from 1961 to 1992. The rate of growth slowed gradually during this period, going from 5.4% a year between 1961 and 1971, to 1.7% between 1986 and 1992.⁵ How would these figures be affected under a broader definition of economic activity, which would encompass both market production and households' unpaid work?

Table 4.8 shows GDP and VUW at constant 1986 prices as well as some related indicators. Constant price VUW is obtained by valuing the hours of unpaid work for each year at the opportunity or replacement costs of 1986, on the assumption of no growth in household productivity. In this scenario, the growth of VUW amounts to about 1.8% a year, 2 percentage points less than that of GDP from 1961 to 1992. The growth of VUW is lower throughout the period, except from 1986 to 1992, when it outpaces that of GDP. These results suggest that GDP overstated economic growth, more broadly defined, until the mid-eighties and understated it from 1986 to 1992.

How large is the 'bias' in economic growth as conventionally measured? The answer depends upon a number of factors, including the period under study, the valuation method chosen and the assumptions made about household productivity. Table 4.9 presents the estimated growth of the total of GDP and VUW. From 1961 to 1992, and under the assumption of no increase in household productivity, the increase of GDP overstates economic growth between 0.6 to 0.8 percentage points a year. The 'bias' is smaller, however, on the assumption of growth in household productivity. With a 2% annual gain in productivity,⁶

5. The annual growth rate of GDP or VUW is calculated throughout as a compound percent rate of change.

the growth of GDP plus VUW is the same as that of GDP alone.

Table 4.8
GDP and Value of Unpaid Work

	GDP	Opportunity cost		Replacement cost	
		Before tax	After tax	Specialist	Generalist
At 1986 prices (\$billions)					
1961	169.3	153.8	96.0	121.2	88.4
1971	287.0	183.9	114.8	146.3	105.7
1981	440.1	225.3	141.1	181.0	129.8
1986	505.7	225.5	141.4	189.7	132.3
1992	559.3	265.6	166.7	215.1	152.8
Volume Index (1986=100)					
1961	33.5	68.2	67.9	63.9	66.8
1971	56.8	81.6	81.2	77.1	79.9
1981	87.0	99.9	99.8	95.4	98.2
1986	100.0	100.0	100.0	100.0	100.0
1992	110.6	117.8	117.9	113.4	115.6
Growth rate (%)					
1961-71	5.4	1.8	1.8	1.9	1.8
1971-81	4.4	2.0	2.1	2.2	2.1
1981-86	2.8	0.0	0.0	0.9	0.4
1986-92	1.7	2.8	2.8	2.1	2.4
1961-92	3.9	1.8	1.8	1.9	1.8
Implicit price Index (1986=100)					
1961	24.2	16.9	22.3	18.8	15.8
1971	33.9	30.4	34.4	33.4	28.1
1981	80.9	75.3	79.1	77.7	70.1
1986	100.0	100.0	100.0	100.0	100.0
1992	123.4	140.8	132.7	137.9	153.4

The broader measures of economic growth in Table 4.9 indicate less pronounced economic cycles than those revealed by GDP alone, thus lending support to the argument that households' unpaid work is counter-cyclical (see Section 1.1.1). GDP growth varies considerably depending on the period, from 1.7% between 1986 and 1992 to 5.4% between 1961 and 1971, a difference of 3.7 points. In contrast, on the assumption of no household productivity gains, the growth of GDP plus VUW is more even, from a low of 1.8% to a high of 4.3% in the same periods, a difference of only 2.5 points.

Table 4.9
Annual Growth of GDP plus VUW

Scenario ¹		Opportunity cost		Replacement cost	
		Before tax	After tax	Specialist	Generalist
		percent per year			
A	1961-71	3.8	4.2	4.1	4.3
	1971-81	3.5	3.8	3.7	3.8
	1981-86	1.9	2.2	2.3	2.3
	1986-92	2.0	1.9	1.8	1.9
	1961-92	3.1	3.3	3.2	3.3
B	1961-71	4.1	4.5	4.3	4.5
	1971-81	3.7	3.9	3.8	3.9
	1981-86	2.1	2.3	2.4	2.4
	1986-92	2.2	2.1	2.0	2.0
	1961-92	3.3	3.5	3.4	3.5
C	1961-71	4.4	4.7	4.6	4.7
	1971-81	3.9	4.1	4.0	4.1
	1981-86	2.2	2.4	2.6	2.5
	1986-92	2.4	2.2	2.1	2.1
	1961-92	3.5	3.6	3.6	3.6
D	1961-71	4.9	5.0	5.0	5.1
	1971-81	4.3	4.3	4.3	4.3
	1981-86	2.6	2.6	2.9	2.7
	1986-92	2.7	2.4	2.4	2.3
	1961-92	3.9	3.9	3.9	3.9

Note:

1. In scenario A, household productivity growth is assumed to be 0% per year, scenario B, 0.5%, scenario C, 1.0%, and scenario D, 2.0%.

4.2 Underlying trends

A key to understanding the results is knowledge of how demographics, time spent on unpaid work and its cost have changed. In essence, change in the estimates is determined by change in these factors. However, it proves difficult to isolate the effect of each one.

4.2.1 Composition of the population

The population grew by 79% between 1961 and 1992. If nothing else had changed, specifically composition of the population, time use and the imputed costs, the time spent on unpaid work, and its value, would have increased by as much. But other factors were at play, as hours of unpaid work increased by only 70%.

6. For comparison, the annual gain in labour productivity in the business sector from 1961 to 1994 was 2.2% per year. See *The Daily*, Cat. No. 11-001E, November 28, 1995.

Table 4.10
Composition of the Population

Population group ¹	Population share				
	1961	1971	1981	1986	1992
	percent				
All persons (15+)					
Females	49.8	50.5	51.0	51.2	51.1
Males	50.2	49.5	49.0	48.8	48.9
Females					
By family status					
Wives	32.5	31.3	30.6	30.3	30.1
Lone parents	2.2	2.5	3.2	3.6	3.8
Children (15+)	7.9	8.6	8.0	7.5	6.8
Living alone	2.0	3.3	5.4	5.9	6.4
Other females	5.1	4.8	3.8	3.9	4.0
By presence of children					
Without children	26.8	28.9	31.5	33.0	34.0
With children	23.0	21.7	19.4	18.2	17.1
By labour force status					
Employed	12.5	18.4	23.8	25.1	26.7
Not employed	37.2	32.1	27.2	26.1	24.4
Males					
By family status					
Husbands	32.5	31.3	30.6	30.3	30.1
Lone parents	0.6	0.7	0.7	0.8	0.8
Children (15+)	10.7	11.1	10.2	9.7	9.0
Living alone	1.5	2.2	3.8	4.1	4.7
Other males	4.9	4.2	3.8	3.9	4.3
By presence of children					
Without children	28.1	29.0	31.4	32.6	33.9
With children	22.1	20.4	17.6	16.2	15.0
By labour force status					
Employed	36.0	35.4	35.5	33.8	32.3
Not employed	14.2	14.1	13.6	15.0	16.6

Note:

1. See Table 3.1.

As can be seen from Table 4.10, the proportion of wives and husbands⁷ declined from 65% in 1961 to 60% in 1992. The impact of such a change on the results is difficult to assess. On the one hand, it may lead to less unpaid work: with fewer couples and fewer children, less time is spent, in aggregate, on help and care of household members. On the other, it may lead to more unpaid work because there are fewer opportunities to share tasks and to benefit from economies of scale.

Conversely, the proportion of lone parents increased, from 2.9% in 1961 to 4.5% in 1992. It is interesting to note that male lone parents spend more time on unpaid work than do husbands. In contrast, female lone parents tend to spend less time on unpaid work than wives (see Table 4.11). This is indicative of how

family structure affects the sharing of tasks and of the complexity of assessing the effect of demographic change.

The proportion of people living alone increased significantly, from 3.6% to 11% between 1961 and 1992. As mentioned earlier, this may result in substantial losses of economies of scale. People living alone must look after themselves and, by and large, do their own cooking, laundering, shopping, and so on. In households with two or more persons, on the other hand, unpaid work can be shared. Those who live alone spend more time on unpaid work, on average, than non-family persons with shared living arrangements (see Table 4.11).

The proportion of parents with children aged under 19 has declined steadily, from 45% to 32% between 1961 and 1992. This change has some obvious effects on the time spent on unpaid work and on the types of tasks undertaken.

4.2.2 Time spent on unpaid work

Time spent on unpaid work, on average, declined by 4.9% from 1961 to 1992. If this had been a uniform decline for all demographic groups and types of unpaid work, and nothing else had changed, VUW would have declined by as much. On average, the time spent on unpaid work declined up to 1986, due mostly to change in the composition of the population. There is a notable increase in 1992, however, related in part to the slow economic growth since 1990, the decline in average real family income and the significant increase in the unpaid work of men, especially husbands.

The overall average masks substantial differences among demographic groups. Women spend about twice as much time on unpaid work as men, with wives and female lone parents well above the average for women, and older children, well below the overall average. Women with children spend an extra 810 to 1,090 hours annually on unpaid work than those without children, although the difference narrows over time. Not employed women spend between 520 and 710 hours more than their employed counterparts. Not employed mothers of young children have the heaviest unpaid work load. In 1992 for instance, those with two or more children, at least one of whom is a pre-schooler, are estimated to spend close to 3,000 hours annually on unpaid work.

7. Including common law partners.

Family status, labour force status and the presence of children have considerably less impact in absolute terms on the time men spend on unpaid work. In part this reflects men's longer hours of paid work as well as customary roles. On average, men spend 67% more time on paid work and related activity than women (1,640 hours against 990 in 1992).⁸ Husbands and male lone parents spend more time on unpaid work than other males, but from 600 to 1,130 hours less than their female counterparts. Men with children spend from 210 to 380 hours more than those without children, but from 930 to 1,340 hours less than women with children.

Table 4.11
Hours of Unpaid Work per Person

Population group ¹	1961	1971	1981	1986	1992
	hours per year				
All persons (15+)	1 223	1 195	1 165	1 108	1 164
Females	1 663	1 593	1 520	1 472	1 482
Males	787	789	797	727	831
Females					
By family status					
Wives	2 008	1 948	1 846	1 794	1 762
Lone parents	1 746	1 831	1 737	1 608	1 770
Children (15+)	676	673	666	666	676
Living alone	1 180	1 160	1 135	1 152	1 164
Other females	1 148	1 101	1 053	877	995
By presence of children					
Without children	1 161	1 142	1 165	1 177	1 210
With children	2 248	2 194	2 096	2 007	2 024
By labour force status					
Employed	1 136	1 219	1 223	1 206	1 223
Not employed	1 841	1 807	1 780	1 729	1 765
Males					
By family status					
Husbands	881	900	918	850	1 001
Lone parents	944	1 003	1 003	999	1 014
Children (15+)	510	491	472	378	396
Living alone	861	817	782	732	831
Other males	732	703	674	576	521
By presence of children					
Without children	692	683	702	645	716
With children	908	939	966	891	1 090
By labour force status					
Employed	775	770	763	674	765
Not employed	818	838	884	845	960

Note:

1. See Table 3.1.

8. See Frederick, *As Time Goes By... Time Use of Canadians*, Table 1A. More comprehensive measures, which include both paid and unpaid work, typically show that women and men spend roughly the same amount of time on overall work activity.

The overall trend, likewise, masks different underlying trends. Women are spending less time on unpaid work. Fewer children, increased labour force participation, the diffusion of time-saving household appliances (microwaves, dishwashers, self-cleaning ovens) and the availability of market substitutes (particularly for child care and food preparation) are some of the underlying factors. Men, on the other hand, are spending more time on unpaid work. Their participation in the labour force is declining and they appear to be doing more of the tasks traditionally done by women.

Wives do about three quarters of the unpaid work of all women and husbands have a similar share of that of men, so that they set the overall trend for women and men. It might be noted that while husbands, on average, are doing more (120 hours more in 1992 than in 1961), it does not make up for the decline in the unpaid work of wives (250 hours less in 1992).

Table 4.12
Composition of Time Spent on Unpaid Work

Type of unpaid work ¹	1961	1971	1981	1986	1992
	percent				
Domestic work	56.6	56.4	56.8	55.7	58.7
Meal preparation	27.9	27.3	26.7	24.4	23.1
Cleaning	13.9	14.0	14.4	16.4	14.6
Clothing care	4.9	4.8	4.8	5.4	5.3
Repairs and maintenance	7.5	7.7	8.3	7.0	11.4
Other domestic work	2.5	2.6	2.6	2.4	4.3
Help and care	16.2	15.1	13.5	11.2	11.0
Management and shopping	12.3	12.9	13.8	17.7	14.6
Transportation and travel	9.4	9.9	10.2	10.1	10.0
Other unpaid work	5.5	5.7	5.7	5.4	5.8

Note:

1. See Table 3.2.

Table 4.12 shows the distribution of time spent on unpaid work by activity. Households do roughly 95% of their unpaid work for themselves, with the remainder devoted to volunteering and informal help and care to friends, neighbours and relatives. Food preparation is by far the most time consuming activity, taking about 25% of the total. Time spent on food preparation and on help and care to household members however is steadily falling. There are several factors at play here, including substitution to the market, the use of time-saving technology, and fewer children per household. The time devoted to management and shopping as well as to repairs and

maintenance, in contrast, appears to be on the rise and a little more time is devoted to cleaning the house and to clothing care.⁹

The division of unpaid labour between the sexes varies significantly by activity, as seen in Table 4.13. Thus, clothing care is undertaken almost exclusively by women, and repairs and maintenance, largely by men. Women do most of the food preparation, cleaning and care-giving within the household. Management, shopping, transportation and travel, other domestic work and other unpaid work are more equally shared.

Table 4.13
Women's Share of Time Spent on Unpaid Work

Type of unpaid work ¹	1961	1971	1981	1986	1992
	percent				
Domestic work	71.6	71.1	69.8	73.0	66.9
Meal preparation	82.5	81.4	80.1	81.7	76.0
Cleaning	69.1	71.5	71.8	72.8	78.6
Clothing care	95.2	94.7	94.1	93.9	92.0
Repairs and maintenance	29.4	28.0	26.8	34.5	25.5
Other domestic work	44.2	46.1	46.6	51.4	56.2
Help and care	74.5	74.5	73.8	73.2	71.8
Management and shopping	58.9	59.1	59.6	57.1	60.8
Transportation and travel	50.9	52.4	53.1	56.0	58.0
Other unpaid work	54.6	55.3	56.2	63.1	57.1

Note:

1. See Table 3.2.

There has been a reallocation of tasks between the sexes over time. Most notably, women are spending relatively more time on management, shopping, transportation and travel. The higher proportion of households with more than one vehicle, the combination of errands with trips to and from place of employment or the day care centre are some of the underlying factors. Men, on the other hand, are spending relatively more time on repairs and maintenance, as well as on tasks traditionally done by women like food preparation, clothing care and care-giving within the household.

4.2.3 Opportunity and replacement costs

The single most important factor underlying the increase of VUW from 1961 to 1992 is the increase in nominal wages. Over the period, the hourly opportunity cost before tax rose by 730%, the after-tax one, by 490%, the average hourly replacement cost for the specialist variant, by 640%, and the one for the generalist variant, by 870% (as measured by the implicit price index, see Table 4.8).

As mentioned earlier, one of the main criticisms of the opportunity cost method is that it reproduces the difference in women's and men's earnings in the valuation of unpaid work. Table 4.14 shows the imputed opportunity cost, expressed on an hourly basis, by sex. The after tax opportunity cost of unpaid work for women was 65% of men's in 1961 and had risen to 82% in 1992.

Table 4.14
Imputed Opportunity Cost¹

	1961	1971	1981	1986	1992
	dollars per hour				
Females					
Before tax ²	1.52	2.80	7.03	9.42	13.46
After tax ³	1.26	1.98	4.54	5.93	8.28
Males					
Before tax ²	2.39	4.15	9.84	12.86	17.99
After tax ³	1.94	2.91	6.68	8.10	10.11
Ratio of female to male opportunity cost	percent				
Before tax ²	63.5	67.3	71.5	73.3	74.8
After tax ³	65.2	68.0	68.0	73.2	81.9

Notes:

1. National averages, weighted by employment income.

2. Including employers' contributions.

3. Excluding employers' and employees' contributions.

The gap between the opportunity cost before and after tax has widened over the period, reflecting the increases in tax rates and average taxable income. For women, the opportunity cost after tax is only 62% of the one before tax in 1992, against 83% in 1961. For men, the same ratio is 56% in 1992, against 81% in 1961. Women's marginal tax rate, on average, increased from 14% to 29% between 1961 and 1992; men's went from 17% to 41% in the same period. Marginal tax rates vary significantly across the provinces. In 1992, they are among the highest in Quebec (34% for women, 46% for men), and among the lowest in Prince Edward Island (28% for women and men).¹⁰

9. The increase noted for shopping and the decline for repairs and maintenance in 1986 are related to the fact that the time use survey was carried out in November and December.

The adjustment for social security contributions is small by comparison. Premiums payable to the Canada Pension Plan and the Quebec Pension Plan were 1.8% of pensionable earnings in 1971, 1981 and 1986 and 2.4% in 1992, for both employers and employees. Unemployment insurance premiums, also the same for both, were between 1% and 1.7% of insurable earnings in 1961 and 1971. Employers' premiums were 2.52% of insurable earnings in 1981, 3.29% in 1986 and 4.2% in 1992. Employees' premiums, somewhat lower, were 1.8% of insurable earnings in 1981, 2.35% in 1986 and 3% in 1992. The impact of this adjustment is assessed below (see Section 4.3.2).

Table 4.15
Imputed Replacement Cost

Type of unpaid work	1961	1971	1981	1986	1992
	dollars per hour				
Replacement cost (specialist)¹					
Unpaid work	1.60	2.83	6.55	8.45	11.74
Domestic work	1.45	2.57	6.16	7.84	10.75
Meal preparation	1.28	2.28	5.39	6.64	9.18
Cleaning	1.62	2.87	6.79	9.03	12.03
Clothing care	1.28	2.27	5.76	7.39	10.11
Repairs and maintenance	1.84	3.26	8.22	10.21	14.78
Other domestic work	1.05	1.85	4.31	6.19	9.39
Help and care	1.14	2.01	4.91	6.31	9.64
Management and shopping	2.96	5.23	11.37	14.90	19.58
Transportation and travel	1.41	2.51	5.41	6.87	9.86
Other unpaid work	1.37	2.42	5.43	7.35	10.82
Replacement cost (generalist)¹					
Unpaid work	1.12	1.97	4.89	6.84	10.57
Household work	0.88	1.56	3.99	5.65	8.85

Note:

1. National averages, with hours of unpaid work in 1986 as the weight. Including employers' contributions and a 15% upward adjustment for room and board in personal service and child care occupations.

Table 4.15 shows the hourly replacement cost by type of unpaid work and by method. Overall, the replacement cost is greater with the specialist variant. The replacement cost for management and shopping is the highest, but rises least rapidly, perhaps reflecting little substitution to the market. That for help and care is among the lowest, but rises rapidly, reflecting in part a higher demand for child care services. The replacement cost for meal preparation rises

slowly, despite households' increasing reliance on the market for food services.

The generalist variant of the replacement cost method gives the lowest estimate for an hour of unpaid work in 1961, \$1.12 an hour, against \$1.26 for women's opportunity cost after tax, \$1.60 for the average replacement cost (specialist) and \$1.94 for men's opportunity cost after tax. Nonetheless, this cost has been rising against the others, especially since 1981. This may reflect substitution to market sectors where generalist occupations are predominant. Indeed, the number of persons employed full-year, full-time in personal service occupations grew twice as fast as overall full-year, full-time employment from 1981 to 1986 and about three times as fast from 1986 to 1991. The number of those employed full-year, full-time in child care occupations grew even more rapidly, especially since 1971.

4.3 Sensitivity tests

Sensitivity testing involves assessing the difference made to an estimate when the underlying data, procedures or assumptions used in its calculation are changed. In the estimation of VUW, for example, the time spent on one activity or its replacement cost can be reduced or increased by 2%, 5% or 10%, or, in the case of opportunity cost after tax, the marginal tax rate can be replaced with the average tax rate. In all cases, VUW is recalculated, along with the percentage difference between the new estimate and the initial one, to see the effect of the change. Such tests give an idea of the possible magnitude of the estimation error due to sampling variability or imputation for instance and of the impact of adopting a particular procedure or assumption. This section focuses on the percentage difference between the new and the old estimates while Appendix Tables D.1-D.3 show additional statistics.

4.3.1 Sensitivity to time use data

At a more detailed activity level, estimates of time use are subject to a greater degree of seasonality, sampling variability and response or classification error. A useful test of the potential effect of these factors involves varying the time spent on unpaid work. Table 4.16 shows the impact of a 10% increase in the time spent on a particular activity on the estimate of VUW at replacement cost (specialist). Thus,

10. In cases such as this one, the imputed rate is the same for women and men. This occurs whenever the average taxable income of the two groups falls in the same tax interval. Figures presented are averages of provincial estimates, with taxable income serving as the weight.

a 10% increase in time spent on meal preparation in 1992 raises VUW by 1.8%. In this instance, the sensitivity to change decreases over time because the share of meal preparation in unpaid work is declining. The results indicate that the data on time spent on specific activities would have to be grossly erroneous for VUW to be significantly altered.

Table 4.16
Sensitivity to the Data on Unpaid Work

Type of unpaid work	Change in the estimate ¹				
	1961	1971	1981	1986	1992
	percent				
Domestic work	5.2	5.1	5.3	4.9	5.4
Meal preparation	2.3	2.2	2.2	1.8	1.8
Cleaning	1.4	1.4	1.5	1.7	1.5
Clothing care	0.4	0.4	0.4	0.5	0.4
Repairs and maintenance	0.9	0.9	1.0	0.8	1.3
Other domestic work	0.2	0.2	0.2	0.2	0.3
Help and care	1.2	1.1	1.1	0.8	0.9
Management and shopping	2.3	2.4	2.4	3.0	2.4
Transportation and travel	0.9	0.9	0.8	0.8	0.8
Other unpaid work	0.4	0.4	0.4	0.5	0.5

Note:

1. Change in VUW at replacement cost (specialist) resulting from a 10% increase in the time spent on each activity.

The estimation of VUW for 1961 and 1971 relies on an imputation of the time spent on unpaid work. Moreover, the imputation for 1961 is constrained, for each activity and population group, to be within plus or minus 10% of the hours of unpaid work in 1981, on the view that activity patterns change only gradually. Sensitivity to this constraint is tested by varying hours of unpaid work for 1961 by as little as +/-5% and as much as +/-15% from the 1981 benchmark estimate, and those for 1971 by half as much. In essence, this amounts to an assumption of slower change in activity patterns in the first case, and more rapid change in the second.

Table 4.17 reveals that the estimate of VUW is not overly sensitive to this constraint. Raising or lowering it by 5 percentage points for 1961 leads at most to a 2.5% change in VUW. Two points are worthy of mention. First, the replacement cost specialist estimate appears to be the most sensitive. This arises from change in the composition of unpaid work and a different replacement cost for each activity. Second, the assumption of more rapid change in the time spent on unpaid work over the sixties and seventies results in lower estimates of VUW. Conversely, with

slower change in time spent on unpaid work, the estimates of VUW increase.

Table 4.17
Sensitivity to the Imputation of Time Spent on Unpaid Work, 1961 and 1971

Rate of change ²		Change in the estimate ¹			
		Opportunity cost		Replacement cost	
		Before tax	After tax	Specialist	Generalist
		percent			
Slower	1961	2.2	2.2	2.5	2.3
	1971	0.8	0.8	0.9	0.8
Faster	1961	-1.7	-1.7	-1.9	-1.7
	1971	-0.6	-0.6	-0.7	-0.6

Notes:

1. Change in VUW under alternate assumptions about the change in time spent on unpaid work from 1961 to 1981.
2. Hours of unpaid work for 1961 are within +/- 5% of the 1981 benchmark in the case of slower change and within +/- 15% in that of faster change.

4.3.2 Sensitivity to imputed costs

This section examines the sensitivity of the VUW estimates to change in the opportunity and replacement costs. It focuses on a few issues, namely: 1) the adjustment for social security contributions; 2) the transmission of the female-male earnings gap to the value of unpaid work; 3) the marginal tax rate adjustment for the opportunity cost method; and (4) the selection of occupations for the replacement cost method.

In the case of the opportunity cost before tax variant and of both variants of replacement cost, employers' social contributions are added to estimates of hourly earnings. With the opportunity cost after tax variant, on the other hand, employees' contributions are subtracted. No such adjustments were made in previous Statistics Canada studies and there is some debate about whether they should be made, for which methods, and how. As can be seen in Table 4.18, the adjustment is not substantial. Estimates of VUW are only 1.3% lower in 1961 when employers' contributions are not added in. They are 4.5% to 5.6% lower in 1992, because contribution rates have increased over time. This implies that the inclusion of employers' contributions raises the growth of VUW. In the case of the opportunity cost after tax variant, the effect of not subtracting employees' contributions is the reverse: it slows the estimated growth of VUW.

5 International comparisons

Many national and international statistical agencies, academics and research groups are engaged in the measurement and valuation of unpaid work. In recent years, for instance, the statistical agencies of Australia, Germany, New Zealand and Finland have developed national estimates. The International Labour Organization has published two comprehensive reviews of studies in this area.¹ The Organisation for Economic Co-operation and Development (OECD) recently compared estimates of the value of households' non market production in several member countries.² It has also established an information network on household production and is compiling a cross-national database.

The Statistical Office of the European Communities (Eurostat), for its part, is planning a harmonized survey of time use to be carried out in member countries in 1996-97. As well, the International Research and Training Institute for the Advancement of Women (INSTRAW), in concert with the Statistical Office of the United Nations Secretariat, is undertaking a six-year project to measure and value unpaid work in several countries. Both the Eurostat and INSTRAW initiatives are expected to significantly influence future research in the field.

The measurement and valuation of unpaid work dates back to the first half of the century. The National Bureau of Economic Research published estimates for the United States as early as 1921. In Norway, household work was included in the estimates of national income from 1935 to 1943.³ Most early studies dealt with the domestic services provided by married women with no paid job. They applied a crude variant of the replacement cost method which does not require data on the time spent on unpaid work. With the advent of the time use survey, however, recent studies have been able to extend the coverage of the population and explore new methods of measurement and valuation.

This chapter provides a comparison of a number of studies for Canada and other OECD countries.⁴ Table 5.1 contains a summary description of the studies (coverage, method, results, etc.). As might be expected, methods vary considerably among studies, making their results difficult to compare. International comparisons require a standardized population, a common definition of unpaid work, comparable measurement and valuation methods and the same reference period.

5.1 Population coverage

The studies under review cover either a broad segment of the population, women only, or married women without paid jobs. The authors of the earliest studies, notably Lindahl, Mitchell and Kuznets, recognized the importance of the unpaid work of all members of the household but, in the absence of time use data, their studies were limited to the domestic services of married women without a paid job.

Among studies with a broader coverage, several differences hinder comparisons. The most important one relates to coverage in terms of age. There is a lower age limit in all studies and an upper age limit in some of them, usually corresponding with the age requirement for time use survey respondents. The Norwegian study, for example, covers persons aged 16 to 74. Several studies cover persons aged 15 years and over, some are restricted to persons aged 18 years and over and others cover children as young as 6 years of age.

Other minor differences, not always related to the time use surveys, concern the treatment of people living in a collective dwelling or an institution, military personnel, foreign residents and nationals residing abroad. In some instances, an imputation is made for persons outside the scope of the time use survey. In the New Zealand study, for example, the unpaid work of households serves to estimate that of persons living in a collective dwelling or an institution, while in this one, the approximation for the Yukon and the Northwest Territories is based on the rest of Canada.

1. See Goldschmidt-Clermont, *Unpaid Work in the Household*, 1982, and *Economic Evaluations of Unpaid Household Work: Africa, Asia, Latin America and Oceania*, 1987.

2. See Chadeau, "What is Households' Non-Market Production Worth?" *OECD Economic Studies*, 1992.

3. See Brathaug, "Value Added in Households," 1991, p. 2-3.

4. For some other international comparisons, see Chadeau, "Measuring Household Activities: Some International Comparisons," *Review of Income and Wealth*, 1985; Hawrylyshyn, "The Value of Household Services: A Survey of Empirical Estimates," *Review of Income and Wealth*, 1976; and Quah, "Country Studies and the Value of Household Production," *Applied Economics*, 1989.

In most studies, a national estimate is obtained by summing estimates made for specific population groups. The number of groups varies substantially, from only one, very broadly defined, as in Schettkat's study on the Federal Republic of Germany, to several hundred, narrowly defined, as in Statistics Canada studies. The classification criteria are usually chosen among the following: sex, labour force status, family status as well as number and age of children.

5.2 Definitions and source data

The estimates pertain either to domestic work (DW), household work (HW) or unpaid work (UW). Domestic work is loosely defined here as the activities carried out by paid domestic staff. While the time use surveys on which most studies rely are similar in many respects (most employ the diary method for instance), they do not follow internationally recognized guidelines (see Section 2.4). Moreover, some of them are actually small-scale test surveys without all the features of regular surveys (e.g., those for Statistics Canada (1985), the Australian Bureau of Statistics (1990) and the New Zealand Department of Statistics (1992)).⁵ Differences in time use survey design certainly affect comparability between studies, but it is difficult, if not impossible, to assess their effect.

5.2.1 Definitions

There are several differences with respect to the definition of household or unpaid work. For example, Brathaug, Otake and Shamseddine exclude shopping, for no apparent reason. Shopping for personal care services is excluded in this study, but included in several others. The New Zealand study adopts a fairly broad definition of unpaid work, but excludes travel related to shopping on the grounds that it does not satisfy the third person criterion. Ironmonger and Sonius include education, even though it does not satisfy the third person criterion.

The most recent estimates for Australia and New Zealand encompass community and civic work, which are excluded here and in the Norwegian estimates. Kendrick leaves out playing with children, but counts school work, volunteer work and looking for a job

under 'other unpaid labour services'. Murphy includes crafts and hobbies, while several studies exclude them. This variety reflects not only the diversity of views with respect to household or unpaid work and the third person criterion, but also different situations with respect to availability and classification of data.

5.2.2 Data on time use

Many early time use surveys were limited to one or a few locations but were used nonetheless to derive national estimates. Chicha-Pontbriand and Kendrick rely on a survey of households in Syracuse, New York in 1967-68; Statistics Canada's study (1978), on surveys for Halifax and Toronto; the Australian study (1990), on one for Sydney; Chadeau and Fouquet's study, on one of urban households; and Ironmonger and Sonius' study, on one for Melbourne and Albury-Wodonga. Extrapolation to the national level from such surveys leaves something to be desired, but seems reasonable so long as the major factors influencing unpaid work (sex, family status, presence of children and employment) are taken into account and variation by region is not substantial.

Several studies rely upon data for specific months. Statistics Canada's estimates for 1981 and 1986 reflect time use in the fall; the Australian ones for 1986-87, in May and June; S  ntti's for Finland, between March and mid-June; Bonke's for Denmark, from January to March; and those for New Zealand, in August. Seasonal variation in unpaid work hinders comparisons between studies. With the increasing number of annual time use surveys, however, this problem is likely to disappear.

A number of studies provide estimates for more than one year and a few provide lengthy time series. In the latter case, time spent on unpaid work is sometimes assumed to be constant over time (Adler and Hawrylyshyn, Chicha-Pontbriand, Kendrick, Shamseddine). Another case in point is Eisner's study covering the period from 1946 to 1981, in which time spent on unpaid work is assumed constant prior to 1965 and based on interpolations between three benchmark years (1965, 1975, 1981) thereafter. This assumption seems just as reasonable as the one that unpaid work is fairly stable across regions. Kendrick examined seventeen, mostly small-scale, time use surveys done in the United States between 1924 and 1976 and concluded that there was no discernible trend in household work.⁶ Despite the assumption of constant

5. The date given as reference is the study's publication date.

time use, these studies at least show the impact of changes in demographics and in imputed costs.

5.3 Valuation methods

Opportunity cost methods are classified as before tax (OC-BT), after tax (OC-AT), and after tax and deduction of work related expenses (OC-ATE) in Table 5.1. Replacement cost methods are subdivided into specialist variant (RC-S) and generalist variant (RCG). There are important differences in terms of what and whose earnings the imputed costs are based upon and whether or not these costs vary by demographic group. Generally, they arise from data limitations, dissimilar classifications or, simply, from the diverse views on the application of the valuation methods.

5.3.1 Opportunity cost

In the case of opportunity cost, the main difference between studies is whether or not an adjustment is made for taxes. Some studies apply both variants of opportunity cost for the purpose of comparison. Others apply only the before tax variant due to the technical difficulty of the tax calculation. This is the case with the Danish, Australian (1990) and Norwegian studies. At times, the choice of variant depends on whether opportunity cost is considered from the household's or society's perspective. Among studies that apply the after tax variant, some deduct the marginal tax rate (Statistics Canada and Murphy), and others, the average tax rate (Australian Bureau of Statistics, 1994). The use of a marginal or average tax rate results in substantially different estimates (see Section 4.3.2).

Two studies deduct job-related expenses to arrive at the opportunity cost. In the 1994 Australian study, the adjustment is the same for women and men. In contrast, Murphy deducts day care expenses, direct commuting costs (e.g., gasoline, transit fares) and the value of commuting time. He assumes that only women incur day care expenses and thus arrives at a different adjustment for women and men.

The imputation of opportunity cost is sometimes based on limited information. Chicha-Pontbriand, for

instance, bases it on the earnings of clerical employees and Taimio, on those of agricultural workers. In contrast, in the most recent Australian study, it is derived from more general information on the earnings of full-time non-managerial employees. Early Statistics Canada studies relied on the earnings of full-year, full-time employees, and this one, on the earnings of those employed full-year, full-time, including employees and the self-employed. In addition, there are differences in the treatment of employers' social contributions. Murphy (1982) includes them in his estimates, as do several others, although he left them out in his first study. The recent Australian estimate 'after tax and work related expenses' includes labour costs over and above wages and salaries, but the before tax estimate does not. In this study, employers' social contributions are part of the opportunity cost before tax, but not of the one after tax.

In principle, the imputation of opportunity cost is improved when earnings-related characteristics such as sex, age and education, are taken into account. Most studies, however, follow the group-based approach which does not allow much flexibility. At one extreme, Murphy's study for 1976 is the only one to base opportunity cost on individual earnings. At the other, the 1994 Australian study and Schettkat's for West Germany rely on an overall average opportunity cost. In most cases, the opportunity cost is at least calculated separately for women and men. It is calculated by province and sex in Statistics Canada studies and by sex and level of education in the INSEE study.

5.3.2 Replacement cost

Studies based on the replacement cost method differ mainly in the choice of earnings, either those of specialists or those of 'household work' generalists. Some studies apply both variants for comparison purposes. Eisner used the specialist variant in his early work but switched to the generalist variant because the "currently available wage rates, as for male janitors to apply to household cleaning, seemed too remote and questionable."⁷ Schettkat had information only on household work in total and consequently could apply only the generalist variant. Statistics Canada studies have generally avoided the generalist variant due to the absence of information

6. "Expanding Imputed Values in the National Income and Product Accounts," *Review of Income and Wealth*, 1979, p. 352.

7. "Total Incomes in the United States, 1959 and 1969," *Review of Income and Wealth*, 1978, p. 44.

Table 5.1

Comparison of National Studies

Country, study (date of publication)	Period covered	Population coverage	Definition of unpaid work ¹	Data on time use ²	Valuation method ³	Variation in costs ⁴	Wage adjust- ment ⁵	Ratio of the estimate to GDP ⁶
Australia								
Australian Bureau of Statistics (1994)	1992	Civilian population (15+)	UW	D,N,A	OC-BT	None	No	69
					OC-ATE	None	Yes	52
					RC-S	O	No	58
					RC-G	None	No	54
Australian Bureau of Statistics (1990)	1986/87	Civilian population (15+)	UW	D	OC-BT	S	No	62
					RC-S	O	No	57
					RC-G	None	No	50
Ironmonger and Sonius (1989)	1975/76	Women and employed men (18-69)	UW	D	OC-BT	S	No	43
Canada								
Adler and Hawrylyshyn (1978)	1961,1971	Selected groups	HW	D	OC-AT	R,S	No	44 ⁷
					RC-S	R,S,O	No	45 ⁷
Chicha-Pontbriand (1988)	1951-1981	Wives, husbands and other women	HW	D	OC-BT	S	No	38
					RC-S	S,O	No	37
Statistics Canada (1995)	1961-1992	Persons (15+) in private households	UW	D,N,A,T	OC-BT	R,S	Yes	54
					OC-AT	R,S	Yes	32
					RC-S	R,O	Yes	43
					RC-G	R,O	Yes	34
Statistics Canada (1994)	1992	Persons (15+) in private households	HW	D,N,A	OC-BT	R,S	No	46
					OC-AT	R,S	No	31
					RC-S	R,O	No	41
Statistics Canada (1992)	1981, 1986	Persons (15+) in private households	HW	D,N,T	OC-AT	R,S	No	32
					RC-S	R,O	No	39
Statistics Canada (1985)	1971, 1981	Selected groups	HW	D,N	OC-BT	R,S	No	39
					RC-S	R,S,O	No	34
Statistics Canada (1978)	1971	Selected groups	HW	D	OC-AT	R,S	No	39
					RC-S	R,S,O	No	40
					RC-G	R	No	33
Denmark								
Bonke (1993)	1964-1987	Population (16-74)	HW	D,N,T	OC-BT	S	Yes	35
					RC-S	O	Yes	40
					RC-G	None	Yes	37
Finland								
Säntti <i>et al.</i> (1982)	1980	Persons (11+) in households	HW	D,N	RC-G	None	Yes	42
Taimio (1991)	1860-1987	Women (15-64)	HW	n.a.	OC-BT	S	No	14
Vihavainen (1995)	1990	Population (15+) in households	UW	D,N,A	RC-G	None	Yes	45
France								
INSEE ⁸	1985	Population (15+)	HW	D,N,A	RC-S	O,C	Yes	64
					RC-G	None	Yes	36
Chadeau and Fouquet (1981)	1975	Population (18+)	HW	D,N,A	OC-BT	S, O	Yes	68
					RC-G	None	Yes	44

Table 5.1
Comparison of National Studies - Continued

Country, study (date of publication)	Period covered	Population coverage	Definition of unpaid work ¹	Data on time use ²	Valuation method ³	Variation in costs ⁴	Wage adjust- ment ⁵	Ratio of the estimate to GDP ⁶
Japan								
Otake (1993)	1985	Not employed wives	HW	D,N	OC-BT RC-S RC-G	S S,O S	No No No	12 11 10
New Zealand								
Department of Statistics (1992)	1990/91	Population (12+)	UW	D,N	OC-BT RC-S RC-G	S O None	No No No	68 52 43
Norway								
Brahaug (1991)	1972, 1981	Persons (16-74) in households	HW	D,N,A,T	OC-BT RC-S RC-G	S,C O None	No Yes Yes	40 39 41
Sweden								
Lindahl <i>et al.</i> (1937)	1861-1930	Not employed women and farm women (15+)	DW	n.a.	RC-G	S	Yes	20
United States								
Eisner (1989)	1946-1981	Population (16+)	UW	D,N,A,T	RC-G	None	Yes	33
Kendrick (1979)	1929-1973	Persons (6+) in households	HW	D	RC-G	None	Yes	24
Kuznets (1941)	1929	Not employed women and farm women	DW	n.a.	RC-G	C	Yes	26
Mitchell <i>et al.</i> (1921)	1909-1919	Not employed women (16+)	DW	n.a.	RC-G	None	n.a.	29
Murphy (1982)	1976	Civilian, non-institutional population (18+)	UW	D,N,A	OC-BT OC-AT OC-ATE RC-S RC-G	I I I O None	Yes Yes Yes No Yes	60 51 44 44 32
Murphy (1978)	1960-1970	Civilian, non-institutional population (16+)	HW	D,A	OC-AT RC-S	S S,O	No No	37 34
Shamseddine (1968)	1950-1964	Housewives	HW	D,A	RC-S	S,O	No	24
West Germany								
Schäfer and Schwarz (1994)	1992	Population (12+)	UW	D,N,A	RC-S RC-G	O None	Yes Yes	71 67
Schettkat (1985)	1964-1980	Population (15+)	HW	n.a.	OC-BT OC-AT RC-G	None None None	Yes Yes Yes	49 29 37

Notes:

1. DW = domestic work; HW = household work; UW = household work and other unpaid work.
2. D = diary-based measures; N = nationally representative; A = annually representative; and T = data on unpaid work for different points in time.
3. OC-BT = opportunity cost before tax; OC-AT = opportunity cost after tax; OC-ATE = opportunity cost after tax and work-related expenses;
RC-S = replacement cost (specialist); RC-G = replacement cost (generalist).
4. Imputed costs vary by region (R), sex (S), occupation (O) or other characteristics (C); are calculated at the individual level (I) or do not vary at all (None).
5. Yes/No indicates presence/absence of an adjustment for benefits in addition to wages and salaries, including employers' social contributions.
6. Unless otherwise noted, estimate for the most recent year under study, expressed as a proportion of GDP or GNP.
7. Estimate for 1961.
8. Unpublished study reported in Chadeau, "What Is Households' Non-Market Production Worth?" *OECD Economic Studies*, 1992.

on the wages, room and board received by housekeepers.

The replacement cost may or may not include additional labour costs like employers' social contributions. Murphy (1982) leaves them out of his imputation with the specialist variant, but includes them in the one based on the generalist variant, on the grounds that they would be paid by business in the former case and by the household in the latter.⁸ The imputation of replacement cost in the Australian studies involves no adjustment, due to the difficulty of estimating employers' contributions by occupation. Some studies make elaborate adjustments. Sântti's estimates for Finland, for instance, include vacation pay, employers' contributions to social security and pensions, as well as premiums for accident insurance and unemployment insurance. These adjustments amount to about 27% of the base wage.⁹ The imputed replacement cost in this study is adjusted for employers' contributions to unemployment insurance, the Canada Pension Plan and the Quebec Pension Plan and, in selected occupations, for room and board.

All applications of the specialist variant rely on matching each type of unpaid work to one or more occupations. The matching and the level of detail at which it is carried out invariably differ across studies. The detail ranges from four or five types of unpaid work, as in the studies by Murphy (1978), Otake and Shamseddine, up to 44 in Statistics Canada's (1994) study. Most studies, however, identify about ten types of unpaid work. The selection of relevant occupations varies considerably as well, due in part to differences in the classification of occupations.

In many applications of the specialist variant, each type of unpaid work is valued at a replacement cost which varies on the basis of other factors. In the INSEE study, it varies according to the income of the household, on the implicit assumption that a wealthier household can afford higher quality, more costly, market substitutes. Statistics Canada studies are among the few that take regional variation into account. More importantly, a separate replacement cost is sometimes calculated for women and men. This is the case with early Statistics Canada studies

and with those of Chicha-Pontbriand, Otake and Murphy (1978).

Early applications of the generalist variant were very different from contemporary ones. In the absence of data on time use, early studies made the somewhat unrealistic assumption that married women without a paid job provided the same service as domestic staff and thus valued their unpaid work at the average annual earnings of the latter. In contrast, the replacement cost is now typically based on the hourly earnings of paid domestic staff or housekeepers.

The main problems with the generalist variant are that the duties of domestic employees do not include all household work or other types of unpaid work and the lack of reliable data on earnings. Some studies ignore these problems, while others avoid them by not applying the variant. Still others adopt hybrid methods, applying the generalist variant to the typical work of housekeepers and other methods to the remainder of unpaid work. Thus, in its first study, the Australian Bureau of Statistics applied the generalist variant to all household work except gardening, lawn and pool care, pet care and home maintenance. In its most recent study, it applies the generalist variant to all household work and supplements this estimate with another based on the specialist variant for the remainder of unpaid work. Likewise, in this study, the estimate based on the generalist variant is really obtained through a hybrid approach combining the two variants.

5.4 Results

Table 5.1 shows selected estimates from the studies discussed above, in order to illustrate the rough magnitude of unpaid work and the large differences in the results. The results are expressed in proportion to GDP or GNP, rounded to the nearest percentage point. No adjustment is made to eliminate differences due to method, population coverage, definition of unpaid work or the use of GDP or GNP as a basis for comparison. In the case of studies providing time series, only the most recent estimates are given. In the case of those providing estimates with and without fringe benefits and employers' social contributions, only the estimate including them is presented.

Among the studies with a broad coverage of the population, estimates range from 25% to 70% of GDP or GNP. The variation by valuation method is almost as

8. "Comparative Estimates of the Value of Household Work in the United States for 1976," *Review of Income and Wealth*, 1982, p. 41.

9. Sântti, et al., *Housework Study, Part VIII: Unpaid Housework, Time Use and Value*, 1982, p. 19.

great. Opportunity cost before tax estimates fall between 35% and 70% and those at replacement cost (specialist), between 35% and 60%. Among studies that apply both methods, the opportunity cost before tax is higher than the replacement cost, except in the Danish study. The replacement cost (generalist) method tends to give the lowest estimates, ranging from 25% to 50% of GDP. Among studies that apply both variants of replacement cost, the generalist variant yields lower estimates, with the Norwegian study as the only exception.

Estimates appear to be much higher for some countries than others. Those for Australia, France, New Zealand and the most recent ones for West Germany tend to be among the highest.¹⁰ Canada, Denmark, Norway and the US, on the other hand, tend to have low to mid-range estimates. The extent to which these differences across countries are real or artificial, however, is unclear. Undoubtedly, the type, amount and cost of the unpaid work undertaken in different countries, at different times can vary greatly. But it is difficult to isolate these differences from those in sources and methods.

10. In the recent West German study, the replacement cost based upon earnings net of taxes and social security contributions, but including premiums for vacation and other paid leave, was judged the most appropriate for national accounting purposes. On this basis, the estimates are considerably lower, in the order of 40% of GDP.

6 Conclusion

As this report opened with some remarks from Peter Kirkham, former Chief Statistician of Canada, it seems fitting to conclude with an excerpt of the opening address of Ivan Fellegi, current Chief Statistician of Canada, to the International Conference on the Measurement and Valuation of Unpaid Work: "Our primary objective in hosting this conference, with our colleagues from the Status of Women Canada, is to acquire as much as possible of the knowledge and experience of those who are working on the frontiers of the measurement and valuation of unpaid work. In this way, Statistics Canada, at the very least, will avoid costly and time consuming developmental and experimental work, which would only serve to repeat what has already been done or which is already known elsewhere. We are committed to progress in this field and what we learn at this conference will considerably accelerate the rate at which we can achieve such progress. This conference, then, is not about whether unpaid work should or can be measured and valued, it is about the most effective and efficient ways of going about it."¹

The central debate today has moved beyond the issue of viability of measurement and valuation of unpaid work. The existence of numerous estimates stands as ample evidence of their viability. In some circles, however, desirability is still at issue. Some argue that valuation is fraught with so many problems, and the resulting estimates so precarious, that it is best not to attempt them at all. Others fear that valuation will lead ultimately to payment and taxation of housework, and further government regulation.² Finally, as Ferber and Birnbaum have pointed out, "...some of the resistance to further work on this subject came from those who believed that the 'invaluable' contribution of the homemaker would somehow be demeaned by being assigned a monetary value." They go on to say that: "It is likely, however, that our failure to assign a price for the services of the homemaker has tended to convey the impression that they are valueless rather than priceless..."³

Quite apart from any symbolic value imparted to unpaid work, there are sound reasons for its measurement and valuation, if only to arrive at a better understanding of the market and non-market sectors of the economy through a more comprehensive system of national accounts. Moreover, at a time when Canada's social policy is under review, information on the substantial costs and benefits of unpaid work for the individual, the household and society at large is particularly relevant. The results of this study at least provide an empirical basis for a discussion of the implications of a broader concept of work and production.

The frontiers of knowledge and understanding of unpaid work are expanding quite rapidly, with more frequent, regular and large-scale surveys of time use. Research is increasingly concerned with direct measurement and valuation of the outputs from unpaid work. INSTRAW judges this approach to be feasible and will shortly begin field work in several countries.⁴ The approach holds some promise, as it offers a way around some of the intractable problems with the measurement and valuation of the time spent on unpaid work. Moreover, in principle at least, it yields a measure of unpaid work which is consistent with that of market production. The results from the INSTRAW study are keenly awaited.

Despite the advances of the past two decades, a number of basic questions remain to be resolved. The question of what counts as unpaid work is likely to remain for some time to come. Is it desirable to include all activities which may be considered productive, like exercising, learning, commuting to work and exchanging information and to what end? Are some of the activities often included in unpaid work, such as window shopping, playing with children and taking the dog for a walk, too much like leisure? Progress on the issue of defining unpaid work presumably will bring some solutions or perhaps even some conventions. At the same time, it is bound to bring new questions and issues, some of which are not even anticipated at present.

Resolving the difficult issue of valuation of unpaid work is equally, if not more, important. As Cassels

1. *International Conference on the Measurement and Valuation of Unpaid Work*, 1994, p. 19.

2. See Peter Stockland, "Housework and the taxman," *The Ottawa Sunday Sun*, 2 May 1993, Commentary, p. 3, and Terence Corcoran, "With this debt we'll all do housework," *The Globe and Mail*, 8 April 1994, p. B2.

3. "Housework: Priceless or Valueless?" *Review of Income and Wealth*, 1980, p. 387.

4. International Research and Training Institute for the Advancement of Women, *Statement to the Twenty-Eight Session of the Statistical Commission*, 27 February - 3 March 1995, Agenda Item 11, Demographic and Social Statistics.

and Philipps have pointed out: "Statistical information on the 'value' of unpaid domestic work is a useful corrective to the historical non-valuation of such work. However, in many cases, such data merely exposes, rather than solves, the problem of injustice. As with law, statistical knowledge itself sometimes incorporates and builds upon contestable assumptions. In particular, the use of market proxies to value unpaid labour raises a host of methodological and normative issues that are highly problematic from the point of view of justice and human value."⁵ Assumptions play a crucial role in the valuation but, unfortunately, they cannot be avoided. This is why it is incumbent upon researchers to make their assumptions explicit, so they can at least be examined, debated and, hopefully, improved upon.

This study has taken an economic approach to the measurement, valuation and analysis of unpaid work. But it is clear that other disciplines have much to offer in this area, and that the insight they provide is required for a fuller understanding of the complexity of household behaviour. Luisella Goldschmidt-Clermont, one of the world's leading experts on the measurement and valuation of unpaid work, has stressed the need for a holistic approach to the study of households. In her view: "Household studies are perhaps, in the social sciences, the area in greatest need of an interdisciplinary approach because the household is the place where economics, social values and personal characteristics converge towards the very end of human activity: the transformation of natural and human resources into something capable of meeting human needs and wants...".⁶ Statistics Canada recognizes this need and is undertaking research on several related topics (see the bibliography).

This report has taken stock of what has been done to-date at Statistics Canada and elsewhere to place a dollar value on households' unpaid work. It marks the end of a period where value estimates for Canada were done on an *ad hoc* basis and the beginning of one where they will be done more frequently and regularly. The precise form the estimates will take is still to be determined. Whether they will stand alone or be embedded in a full-fledged household production account, whether they will be based upon the direct or

indirect approach to measuring output, and whether or not new valuation methods will be sought are some issues on the horizon. As with the Conference on the measurement and valuation of unpaid work, one of the aims of this study has been to stimulate debate. The evolution of this debate will undoubtedly shape Statistics Canada's future efforts in the field.

5. *International Conference on the Measurement and Valuation of Unpaid Work*, 1994, p. 42.

6. "Measuring Households' Non-Monetary Production," in Ekins and Max-Neef, eds., *Real Life Economics: Understanding Wealth Creation*, 1992, p. 266.

Appendix Tables

Table A.1
Population by Demographic Group

Demographic group	Population					Population share				
	1961	1971	1981	1986	1992	1961	1971	1981	1986	1992
	number in thousands					percent				
All persons (15+)¹	12 026	14 657	18 352	19 412	21 540	100.0	100.0	100.0	100.0	100.0
Females	5 983	7 405	9 353	9 934	11 008	49.8	50.5	51.0	51.2	51.1
Males	6 043	7 252	8 999	9 478	10 532	50.2	49.5	49.0	48.8	48.9
Employed	5 838	7 885	10 677	11 436	12 712	48.5	53.6	59.3	58.9	59.0
Females	1 508	2 693	4 369	4 877	5 756	12.5	18.4	23.8	25.1	26.7
Males	4 330	5 192	6 308	6 560	6 956	36.0	35.4	35.5	33.8	32.3
Not employed ²	6 188	6 772	7 476	7 976	8 828	51.5	46.2	40.7	41.1	41.0
Females	4 475	4 712	4 984	5 057	5 252	37.2	32.1	27.2	26.1	24.4
Males	1 712	2 060	2 491	2 919	3 577	14.2	14.1	13.6	15.0	16.6
Wives and husbands³	7 815	9 166	11 221	11 759	12 952	65.0	62.5	61.1	60.6	60.1
Wives	3 908	4 583	5 610	5 880	6 476	32.5	31.3	30.6	30.3	30.1
Employed	702	1 550	2 636	2 998	3 643	5.8	10.6	14.4	15.4	16.9
With children ⁴	402	924	1 533	1 712	2 026	3.3	6.3	8.4	8.8	9.4
Not employed	3 206	3 032	2 974	2 881	2 833	26.7	20.7	18.2	14.8	13.2
With children	2 219	1 999	1 615	1 338	1 110	18.5	13.6	8.8	6.9	5.2
Husbands	3 908	4 583	5 610	5 880	6 476	32.5	31.3	30.6	30.3	30.1
Employed	3 254	3 741	4 489	4 459	4 676	27.1	25.5	24.5	23.0	21.7
With children	2 399	2 617	2 862	2 711	2 727	19.9	17.9	15.6	14.0	12.7
Not employed	654	841	1 122	1 420	1 800	5.4	5.7	6.1	7.3	8.4
With children	222	307	286	339	409	1.8	2.1	1.8	1.7	1.9
Lone parents⁵	343	489	714	853	975	2.9	3.2	3.9	4.4	4.5
Females	267	370	589	702	810	2.2	2.5	3.2	3.8	3.8
Employed	80	149	283	341	406	0.7	1.0	1.5	1.8	1.9
Not employed	186	221	306	361	404	1.5	1.5	1.7	1.9	1.9
Males	77	99	124	151	165	0.6	0.7	0.7	0.6	0.6
Employed	42	68	90	104	107	0.4	0.5	0.5	0.5	0.5
Not employed	34	31	35	48	58	0.3	0.2	0.2	0.2	0.3
Children (15+)⁶	2 233	2 888	3 339	3 328	3 412	18.6	19.7	18.2	17.1	15.8
Females	946	1 260	1 459	1 447	1 472	7.9	8.6	8.0	7.5	6.8
Employed	384	479	682	722	752	3.0	3.3	3.7	3.7	3.5
Not employed	562	781	777	725	719	4.8	5.3	4.2	3.7	3.3
Males	1 287	1 629	1 880	1 881	1 941	10.7	11.1	10.2	9.7	9.0
Employed	572	788	996	1 012	1 023	4.8	5.4	5.4	5.2	4.7
Not employed	715	841	884	868	918	5.9	5.7	4.8	4.5	4.3
Persons living alone	428	814	1 890	1 947	2 400	3.6	5.6	9.2	10.0	11.1
Females	244	489	994	1 145	1 378	2.0	3.3	5.4	5.9	6.4
Employed	94	196	433	448	523	0.8	1.3	2.4	2.3	2.4
Not employed	151	293	562	697	855	1.3	2.0	3.1	3.6	4.0
Males	183	324	896	802	1 021	1.5	2.2	3.8	4.1	4.7
Employed	103	203	479	504	597	0.9	1.4	2.6	2.6	2.8
Not employed	80	121	217	298	425	0.7	0.8	1.2	1.5	2.0
Other persons⁷	1 206	1 320	1 388	1 525	1 801	10.0	9.0	7.8	7.9	8.4
Females	616	703	700	761	872	5.1	4.8	3.8	3.9	4.0
Employed	268	319	335	367	432	2.2	2.2	1.8	1.9	2.0
Not employed	351	384	365	393	440	2.9	2.6	2.0	2.0	2.0
Males	588	617	688	765	929	4.9	4.2	3.8	3.9	4.3
Employed	359	392	454	481	554	3.0	2.7	2.5	2.5	2.8
Not employed	229	225	234	284	376	1.9	1.5	1.3	1.5	1.7

Notes:

- Persons aged 15 and over living in a private household.
- Persons who are either unemployed or not in the labour force.
- Married or common-law couples.
- With children under age 19.
- Never married, widowed, divorced or separated parents residing with at least one never-married child.
- Never-married daughters or sons living with one or both parents.
- Non-family members of a household with two or more persons.

Table A.2

Average Hours of Unpaid Work by Demographic Group

Demographic group ¹	Sample size			Hours of unpaid work per person ²				
	1981	1986	1992	1981	1986	1992	1986	1992
	number of respondents			hours per year				
All persons (15+)	2 686	9 744	8 996	1 223	1 195	1 165	1 108	1 164
Females	1 444	5 378	4 994	1 663	1 593	1 520	1 472	1 482
Males	1 242	4 366	4 002	787	789	797	727	831
Employed	1 631	4 818	4 570	868	823	948	901	972
Females	693	2 111	2 025	1 138	1 219	1 223	1 206	1 223
Males	938	2 707	2 545	775	770	763	674	765
Not employed	1 055	4 926	4 426	1 558	1 512	1 481	1 406	1 439
Females	751	3 267	2 969	1 841	1 807	1 780	1 729	1 765
Males	304	1 659	1 457	818	838	884	845	960
Wives and husbands	1 629	5 682	5 040	1 444	1 424	1 382	1 322	1 382
Wives	836	2 991	2 708	2 008	1 948	1 846	1 794	1 762
Employed	401	1 198	1 206	1 567	1 531	1 477	1 405	1 417
With children	204	684	654	1 805	1 757	1 719	1 660	1 691
Not employed	435	1 795	1 502	2 105	2 182	2 172	2 198	2 206
With children	235	942	725	2 338	2 415	2 515	2 557	2 718
Husbands	793	2 691	2 332	881	900	918	850	1 001
Employed	649	1 864	1 668	820	829	836	747	893
With children	367	1 201	1 038	880	900	928	830	1 044
Not employed	144	827	664	1 179	1 216	1 247	1 174	1 282
With children	21	219	168	1 197	1 249	1 315	1 328	1 401
Lone parents	129	574	577	1 567	1 658	1 809	1 500	1 642
Females	91	498	507	1 748	1 831	1 737	1 608	1 770
Employed	53	220	222	1 356	1 404	1 390	1 305	1 391
Not employed	38	278	285	1 915	2 118	2 057	1 896	2 150
Males	38	76	70	944	1 003	1 003	999	1 014
Employed	34	45	45	934	1 003	983	966	975
Not employed	4	31	25	955	1 002	1 055	1 071	1 088
Children (15+)	161	1 066	1 005	580	570	556	503	517
Females	77	460	452	678	673	666	666	678
Employed	14	128	133	575	608	641	752	696
Not employed	63	332	319	738	713	688	580	654
Males	84	606	553	510	491	472	378	396
Employed	18	211	200	555	531	508	372	386
Not employed	66	395	353	474	453	433	385	407
Persons living alone	441	1 887	1 944	1 043	1 024	990	979	1 023
Females	272	1 135	1 122	1 180	1 180	1 135	1 152	1 164
Employed	124	415	350	753	798	842	920	923
Not employed	148	720	772	1 445	1 403	1 381	1 301	1 312
Males	169	752	822	661	817	782	732	631
Employed	122	448	502	625	640	655	650	670
Not employed	47	304	320	1 166	1 114	1 063	870	1 057
Other persons	326	535	430	945	915	865	726	751
Females	168	294	205	1 148	1 101	1 053	877	995
Employed	101	152	114	833	797	780	726	716
Not employed	67	142	91	1 387	1 355	1 322	1 018	1 269
Males	158	241	225	732	703	674	576	521
Employed	115	139	130	741	712	684	593	445
Not employed	43	102	95	718	686	654	547	634

Notes:

1. See footnotes to Table A.1.

2. Survey-based estimates for groups with 60 or more respondents in 1981, 1986 and 1992 and imputations otherwise.

Table A.3
Concordance Between Activity Classifications

Type of unpaid work ¹	General Social Survey, 1992 Activity code and title ²	General Social Survey, 1986 Activity code and title ²	Time Use Pilot Study, 1981 Activity code and title ²
1. Food or meal preparation	101. Meal preparation 102. Baking, preserving food, home brewing, etc.	10. Meal preparation	100. Preparing food and table 841. Preserving foodstuffs
2. Food or meal clean-up	110. Food (or meal) cleanup	11. Meal clean-up	110. Meal cleanup
3. Cleaning	120. Indoor cleaning 130. Outdoor cleaning 182. Stacking and cutting firewood	12. Indoor cleaning 13. Outdoor cleaning	120. Routine chores (indoors) 130. Routine chores (outdoors)
4. Laundry and ironing	140. Laundry, ironing, folding	14. Laundry, ironing, folding	140. Laundry, ironing, folding
5. Clothes repair and shoe care	151. Mending and shoe care 152. Dressmaking and sewing	15. Mending	150. Mending
6. Home repair and maintenance	161. Interior maintenance and repair 162. Exterior maintenance and repair 163. Vehicle maintenance 164. Other home improvements	16. Home repairs and maintenance	160. Repairs - general 161. Interior repairs 162. Exterior repairs 163. Car care and maintenance 164. Home improvements 180. Heat and water upkeep
7. Gardening and grounds maintenance	171. Gardening and grounds maintenance 173. Care of house plants	17. Gardening, pet care ³	170. Animal and plant care, and gardening - general 171. Gardening 173. Care of house plants
8. Pet care	172. Pet care	17. Gardening, pet care ³	172. Pet care
9. Other domestic work, n.e.c.	183. Other domestic work	18. Other uncodeable housework ³	190. Other housework 191. Other indoor housework 192. Other outdoor housework
10. Physical care - children	200. Baby care 210. Child care	20. Baby care 21. Child care	200. Baby care (under 5) 210. Child care (over 5) 218. Child care (mixed ages)
11. Education - children	220. Helping, teaching and reprimanding children 230. Reading, talking and conversation with children	22. Helping, teaching and reprimanding children 23. Reading, talking and conversation with children	220. Helping with homework, instruction - general 221. Help - skills 222. Help - homework 230. Reading to children 280. Conversations, reprimands
12. Medical care - children	250. Medical care - household child	25. Medical care - child	260. Medical care
13. Other care - children	240. Play with children 260. Unpaid baby-sitting 281. Help and other care - household children	24. Play with children 28. Other child care ³	240. Indoor entertaining and play 250. Outdoor entertaining and play 270. Other child care 278. Baby-sitting (unpaid) ³
14. Personal care - adults	271. Personal care - household adults 282. Help and other care - household adults	42. Help and personal care to adults ³	420. Helping adults 421. Routine non-medical care
15. Medical care - adults	272. Medical care - household adults	41. Adult medical care (at home) ^{3,4}	412. Medical care - household adults

Table A.3

Concordance Between Activity Classifications - Continued

Type of unpaid work ¹	General Social Survey, 1992 Activity code and title ²	General Social Survey, 1986 Activity code and title ²	Time Use Pilot Study, 1981 Activity code and title ²
16. Household management and administration	181. Household administration 331. Financial services 332. Government services 350. Other professional services	18. Other uncodeable housework ³ 33. Government and financial services 35. Other professional services	193. Household paperwork 340. Administrative and financial services 341. Financial services 342. Other government services 370. Other services
17. Shopping for goods and services	301. Groceries 302. Clothing, gas, etc. 303. Take-out food 310. Shopping for durable household goods 361. Automobile maintenance and repair services 362. Other repair services 370. Waiting for purchases or services 380. Other shopping and services	30. Everyday shopping 31. Shopping for durable household goods 36. Repair services 37. Waiting and queuing for purchase 38. Other uncodeable purchases and services	300. Shopping - everyday needs 301. Shopping - groceries 302. All other shopping 310. Durable goods 312. House and apartment (purchase, rental,...) 350. Repair services 351. Auto services 352. Clothes repair and cleaning 353. Appliance repair services 354. Household repair services 360. Waiting, queuing for purchase 380. Errands, goods or services, n.e.c.
18. Transport - children	291. Travel: household child	29. Travel: childcare	290. Related travel: childcare
19. Transport - all other household work	190. Travel: domestic 292. Travel: household adult 390. Travel: goods and services	19. Travel: domestic 49. Travel: personal ^{3,4} 39. Travel: goods or services	390. Related travel: shopping 498. Help-related travel ³
20. Volunteer work	660. Volunteer work (organizations)	66. Volunteer work (organizations)	630. Volunteer work (organizations) 631. Attending meetings 632. Serving as officer of a volunteer organization 633. Fund raising 634. Direct help to individuals
21. Other help and care	671. Housework and cooking assistance 672. House maintenance and repair assistance 673. Unpaid baby-sitting 674. Transportation assistance 675. Care for disabled or ill 676. Correspondence assistance 678. Other unpaid help	28. Other child care ³ 41. Adult medical care (at home) ^{3,4} 42. Help and personal care to adults ³	278. Baby-sitting (unpaid) ³ 422. Help to relatives outside the household 423. Help to friends and neighbours 424. Help to others
22. Transport - other unpaid work	691. Travel: civic and voluntary activity ⁴	49. Travel: personal ^{3,4} 69. Travel: organizations ⁴	498. Help-related travel ³ 698. Travel (volunteer work)

Notes:

1. Concordance is based upon subjective assessment.
2. Activity titles (with some minor modifications) are taken from the surveys.
3. The activity includes components that belong to two or more different types of unpaid work.
4. The activity has components that are excluded from the study.

Table A.4
Imputed Costs by Method, Canada, Provinces and Territories

	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
dollars per hour													
Opportunity cost before tax¹													
Females	1961	1.52	1.07	1.25	1.30	1.19	1.56	1.55	1.35	1.37	1.48	1.56	1.69
	1971	2.80	1.99	2.07	2.39	2.18	2.78	2.91	2.46	2.34	2.72	2.99	3.23
	1981	7.03	6.37	5.79	6.17	6.01	7.41	6.61	6.27	6.64	7.38	7.41	8.61
	1986	9.42	8.83	8.26	8.80	8.44	9.53	9.58	8.62	8.74	9.49	9.39	11.37
	1992	13.46	12.06	11.96	12.11	11.63	13.15	14.28	11.87	10.46	12.62	13.54	17.39
Males	1961	2.39	1.90	1.66	1.97	1.85	2.26	2.56	2.14	1.74	2.28	2.66	2.66
	1971	4.15	3.28	2.77	3.47	3.28	3.94	4.46	3.55	2.82	3.93	4.72	4.72
	1981	9.84	9.17	7.08	8.36	8.42	9.80	9.86	8.30	8.12	10.40	10.97	11.13
	1986	12.86	12.39	10.06	12.12	11.82	13.16	13.23	11.25	9.96	12.31	13.26	13.98
	1992	17.99	17.57	15.38	16.84	17.08	17.82	18.92	15.21	12.60	17.11	18.42	19.92
Opportunity cost after tax²													
Females	1961	1.26	0.92	1.08	1.12	1.02	1.29	1.29	1.11	1.13	1.23	1.30	1.41
	1971	1.98	1.44	1.50	1.74	1.57	1.97	2.07	1.69	1.69	1.87	2.11	2.21
	1981	4.54	4.25	3.91	4.08	4.06	4.47	4.48	4.13	4.39	4.96	4.90	5.72
	1986	5.93	5.75	5.35	5.65	5.52	5.55	6.11	5.57	5.70	6.17	6.17	7.38
	1992	8.28	7.45	7.48	7.58	7.40	7.48	9.05	7.13	6.46	7.62	8.64	11.30
Males	1961	1.94	1.59	1.38	1.65	1.55	1.82	2.07	1.77	1.44	1.84	2.15	2.15
	1971	2.91	2.36	1.94	2.53	2.33	2.73	3.13	2.40	2.02	2.71	3.31	3.32
	1981	6.68	6.42	4.57	5.68	5.98	5.89	7.02	5.62	5.69	7.30	7.56	7.80
	1986	8.10	7.68	6.37	7.41	7.37	6.96	8.62	6.93	6.21	8.74	9.31	9.60
	1992	10.11	10.86	9.63	10.54	10.68	8.74	11.10	9.42	7.78	8.60	10.92	12.45
Replacement cost (specialist)^{3,4}													
1. Preparing food or meals	1961	1.36	1.25	1.39	1.27	1.04	1.32	1.39	1.30	1.19	1.39	1.55	1.59
	1971	2.41	2.22	2.32	2.28	1.87	2.33	2.48	2.22	1.97	2.45	2.82	2.90
	1981	5.82	5.31	5.34	4.56	5.04	5.64	5.37	5.09	5.12	6.37	6.23	8.73
	1986	6.89	8.37	7.76	6.63	6.28	7.01	6.87	6.73	6.34	6.98	6.95	9.45
	1992	9.57	8.52	8.81	8.89	8.10	9.41	10.30	8.27	7.59	8.67	9.62	12.30
2. Food or meal clean-up	1961	1.09	0.75	1.12	0.99	0.85	0.97	1.15	1.12	1.03	1.14	1.29	1.55
	1971	1.93	1.32	1.86	1.77	1.53	1.72	2.05	1.91	1.70	2.01	2.35	2.82
	1981	4.80	4.21	5.01	4.58	4.09	4.62	4.69	4.35	4.48	4.99	5.80	7.87
	1986	5.95	6.34	6.36	6.03	5.14	5.76	6.02	5.86	5.48	5.73	6.46	9.19
	1992	8.13	7.55	8.54	7.42	6.82	7.44	9.02	7.17	6.14	7.39	8.62	9.08
3. Cleaning	1961	1.62	1.19	1.16	1.26	1.11	1.47	1.71	1.48	1.47	1.67	1.80	1.91
	1971	2.87	2.11	1.92	2.25	2.01	2.61	3.05	2.53	2.45	2.94	3.27	3.46
	1981	6.79	5.46	5.26	5.62	5.74	6.55	6.90	6.10	6.46	7.28	7.63	9.15
	1986	9.03	7.77	8.08	7.32	8.09	9.02	9.31	8.44	8.24	8.82	9.37	10.06
	1992	12.03	10.43	10.45	9.96	11.05	11.99	12.76	10.33	9.71	10.99	12.26	15.68
4. Laundry and ironing	1961	1.27	0.77	0.97	0.90	0.97	1.34	1.26	1.21	1.13	1.31	1.39	1.39
	1971	2.26	1.36	1.60	1.61	1.74	2.38	2.25	2.06	1.87	2.32	2.53	2.54
	1981	5.72	5.03	5.02	3.72	4.65	6.22	5.35	5.15	5.88	5.45	6.39	6.66
	1986	7.44	7.19	7.99	6.73	7.65	7.48	7.27	6.44	8.54	7.75	7.65	10.66
	1992	10.15	10.39	10.36	7.31	8.52	10.80	10.53	10.09	8.54	8.81	9.79	9.94
5. Clothes repair and shoe care	1961	1.34	1.26	1.37	1.51	1.09	1.25	1.46	1.38	1.15	1.61	1.43	1.43
	1971	2.38	2.23	2.27	2.71	1.97	2.21	2.60	2.36	1.91	2.85	2.61	2.61
	1981	6.30	4.57	4.38	4.53	4.03	6.66	5.98	5.69	6.49	7.57	5.77	5.99
	1986	6.79	4.09	5.34	5.86	5.17	6.62	7.35	6.00	7.54	7.57	6.52	6.73
	1992	9.60	7.53	7.81	9.11	6.68	8.88	10.68	9.54	5.67	8.75	12.62	12.80
6. Home repair and maintenance	1961	1.89	1.13	1.27	1.46	1.31	1.80	1.98	1.68	1.61	1.90	2.05	2.04
	1971	3.34	2.01	2.11	2.62	2.38	3.18	3.51	2.86	2.68	3.34	3.71	3.70
	1981	8.65	6.14	6.79	7.59	6.59	7.92	8.79	8.01	7.72	8.64	9.96	7.28
	1986	10.64	7.17	8.68	9.56	7.62	10.63	11.10	9.10	9.25	9.79	9.99	10.17
	1992	15.70	12.18	11.27	14.65	12.71	14.61	16.85	10.27	12.55	12.00	15.99	13.92
7. Gardening and grounds maintenance	1961	1.71	1.31	0.96	1.31	1.20	1.60	1.77	1.59	1.74	1.68	1.84	1.84
	1971	3.04	2.31	1.59	2.36	2.17	2.63	3.15	2.72	2.89	2.97	3.34	3.34
	1981	7.11	6.61	5.94	5.93	6.04	7.13	6.84	6.67	7.11	7.57	7.84	8.16
	1986	9.10	9.58	8.52	8.24	8.76	8.63	8.97	9.20	9.32	8.77	9.98	10.20
	1992	12.38	10.85	10.35	10.30	10.21	12.86	12.61	11.97	9.28	10.95	12.91	13.14
8. Pet care	1961	1.63	0.94	1.20	1.04	1.11	1.63	1.69	1.96	1.24	1.51	1.58	1.58
	1971	2.90	1.65	2.00	1.87	2.00	2.88	3.01	3.33	2.05	2.67	2.88	2.88
	1981	4.32	6.24	4.15	4.04	3.62	4.95	4.57	3.57	3.77	4.16	5.38	5.61
	1986	6.02	5.63	4.74	5.36	5.24	6.88	6.17	3.84	3.37	5.40	8.08	8.19
	1992	7.63	8.59	9.01	7.45	5.79	9.05	9.00	5.44	4.25	6.41	9.92	10.07

Table A.4
Imputed Costs by Method, Canada, Provinces and Territories - Continued

	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
		dollars per hour											
9. Other domestic work, n.e.c.	1961	0.94	0.61	0.58	0.69	0.57	0.86	1.04	1.05	0.87	1.11	1.19	2.06
	1971	1.67	1.08	0.96	1.23	1.02	1.52	1.85	1.79	1.44	1.96	2.16	3.73
	1981	4.30	3.84	4.34	3.70	3.11	3.89	4.24	3.71	4.25	5.55	5.18	5.41
	1986	6.22	6.10	5.85	5.51	6.71	6.53	6.02	7.00	5.01	7.04	5.89	6.07
	1992	9.66	6.98	11.40	9.13	7.16	8.93	10.12	8.95	7.36	9.48	10.60	11.34
10. Physical care - children	1961	0.68	0.68	0.62	0.37	0.77	1.06	0.70	0.45	0.70	0.80	0.65	0.74
	1971	1.55	1.16	1.03	0.85	1.38	1.87	1.24	0.76	1.16	1.41	1.18	1.33
	1981	3.80	1.64	2.48	2.78	2.18	3.66	3.55	3.53	4.04	4.80	4.36	4.60
	1986	4.81	3.71	2.64	3.36	3.12	4.66	4.55	5.38	5.71	5.10	4.53	7.00
	1992	7.85	3.96	8.89	5.87	6.01	7.87	8.46	8.13	6.12	7.02	7.45	9.29
11. Education - children	1961	2.82	3.04	2.83	2.77	2.74	3.51	2.54	2.40	2.51	2.76	2.66	2.91
	1971	4.99	5.38	4.71	4.97	4.96	6.18	4.52	4.08	4.18	4.86	4.82	5.26
	1981	12.08	12.13	10.04	11.58	10.59	13.78	11.83	11.21	10.79	12.22	11.04	13.84
	1986	16.04	15.57	14.58	16.57	15.10	18.10	16.59	15.86	15.29	15.37	14.48	17.58
	1992	21.34	21.26	17.24	21.00	18.90	22.14	22.21	19.96	17.96	20.11	19.12	23.93
12. Medical care - children	1961	1.57	1.06	1.19	1.22	1.08	1.83	1.51	1.28	1.33	1.39	1.78	1.77
	1971	2.79	1.87	1.97	2.19	1.94	3.25	2.69	2.18	2.20	2.46	3.23	3.22
	1981	7.19	5.99	5.39	5.85	6.03	7.88	6.80	6.15	7.50	7.12	8.51	8.87
	1986	9.56	8.00	8.76	8.73	7.32	10.42	9.62	9.28	9.11	9.71	8.28	8.28
	1992	13.10	11.18	10.93	9.79	11.68	14.50	13.31	8.30	11.61	10.90	13.28	13.73
13. Other care - children		See activity 10											
14. Personal care - adults	1961	1.51	1.23	1.29	1.13	1.15	1.62	1.45	1.28	1.27	1.42	1.77	1.49
	1971	2.69	2.17	2.14	2.04	2.07	2.87	2.59	2.19	2.12	2.52	3.22	2.71
	1981	6.46	6.04	4.51	4.47	5.58	6.89	5.94	5.50	6.68	6.55	7.56	8.07
	1986	8.49	8.01	7.74	6.02	7.96	8.65	8.79	7.97	8.19	8.12	8.81	9.02
	1992	11.58	10.69	9.99	8.93	10.15	11.78	12.01	10.79	10.52	10.65	13.07	13.27
15. Medical care - adults		See activity 12											
16. Household management and administration	1961	3.93	3.81	3.93	3.68	3.60	3.47	4.14	3.13	3.38	4.05	4.45	4.45
	1971	6.92	6.87	8.48	6.54	6.45	6.09	7.33	5.31	5.58	7.09	8.02	8.02
	1981	11.07	10.92	9.28	10.02	8.33	11.59	11.09	8.41	9.61	10.49	11.89	12.25
	1986	14.24	11.52	11.88	13.02	10.95	13.66	15.09	13.98	12.79	15.10	13.02	15.17
	1992	18.81	16.00	13.63	17.27	14.65	20.03	19.83	17.16	14.16	18.00	17.52	17.83
17. Shopping for goods and services	1961	2.89	2.50	2.11	2.22	2.13	2.84	2.96	2.62	2.25	3.16	2.95	2.95
	1971	5.10	4.40	3.50	3.97	3.83	4.99	5.25	4.45	3.73	5.55	5.33	5.33
	1981	11.40	9.86	10.26	10.36	9.15	11.46	10.76	11.00	10.98	13.37	12.69	13.20
	1986	14.95	12.08	13.77	13.27	13.75	15.12	14.62	12.75	15.94	16.18	16.28	16.66
	1992	19.84	17.20	16.55	17.90	19.39	19.54	19.98	18.55	16.56	19.70	19.87	24.15
18. Transport - children	1961	1.41	1.10	1.22	1.15	1.11	1.32	1.57	1.46	1.50	1.44	1.50	1.51
	1971	2.51	1.94	2.02	2.07	2.00	2.33	2.79	2.50	2.48	2.54	2.73	2.75
	1981	5.41	5.20	3.49	4.30	5.38	4.99	5.34	4.98	5.14	6.15	7.18	5.98
	1986	6.87	7.25	5.36	5.49	6.81	6.67	7.42	8.85	8.06	8.10	6.56	7.30
	1992	9.86	8.81	6.32	8.48	7.83	9.22	11.04	8.26	7.68	7.92	9.65	10.38
19. Transport - all other household work		See activity 18											
20. Volunteer work	1961	2.24	1.90	1.85	1.99	2.07	2.39	2.30	2.07	2.09	2.17	2.12	2.37
	1971	3.95	3.35	2.74	3.58	3.72	4.21	4.06	3.52	3.45	3.83	3.85	4.29
	1981	7.91	8.68	6.53	7.17	6.18	9.09	7.82	7.01	7.17	6.32	7.66	8.34
	1986	10.40	7.91	9.78	9.63	8.45	11.81	10.69	9.54	9.18	10.55	9.19	12.89
	1992	14.50	12.78	13.46	12.06	11.30	15.29	15.95	11.99	11.31	13.10	12.87	19.48
21. Other help and care		See activity 9											
22. Transport - other unpaid work		See activity 18											

Notes:

1. Includes employees' and employers' CPP, QPP and UI contributions.
2. Net of marginal taxes and employees' and employers' CPP, QPP and UI contributions.
3. Includes employers' CPP, QPP and UI contributions. See Table 3.3 for the occupations matched with each activity.
4. For the generalist variant, all household work except child care is valued at the cost for 'other domestic work'; child care, at the cost for 'physical care of children'; and other unpaid work activities, at the same costs as with the specialist variant.

Table B.1
Hours of Unpaid Work, Canada, Provinces and Territories

Summary statistics	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
Hours of unpaid work (millions)	1961	14 709	334	81	591	458	4 070	5 198	756	747	1 068	1 378	27
	1971	17 519	394	86	633	497	4 897	6 336	801	739	1 284	1 815	37
	1981	21 386	481	106	750	613	5 780	7 560	886	833	1 879	2 446	52
	1986	21 511	481	105	752	610	5 661	7 681	883	830	1 934	2 519	55
	1992	25 064	543	114	848	670	6 464	9 246	973	865	2 244	3 028	69
Annual percentage change	1961-71	1.8	1.7	0.6	0.7	0.6	1.9	2.0	0.6	-0.1	1.9	2.8	3.3
	1971-81	2.0	2.0	2.1	1.7	2.1	1.7	1.8	1.0	1.2	3.9	3.0	3.3
	1981-86	0.1	-0.0	-0.1	0.1	-0.1	-0.4	0.3	-0.1	-0.1	0.6	0.6	1.3
	1986-92	2.6	2.0	1.5	2.0	1.6	2.2	3.1	1.6	0.7	2.5	3.1	3.8
	1961-92	1.7	1.6	1.1	1.2	1.2	1.5	1.9	0.8	0.5	2.4	2.6	3.1
As a percent of hours of paid work	1961	122.5	..	..	..	..	..	..	..	..	..	..	..
	1971	120.7	..	..	..	..	..	..	..	..	..	..	..
	1981	116.0	158.5	132.1	141.7	147.0	130.1	107.5	114.3	111.9	91.9	118.1	..
	1986	110.7	159.9	122.1	132.0	139.2	123.1	99.4	108.0	105.5	97.9	118.4	..
	1992	123.3	179.6	131.6	144.5	138.3	136.7	116.8	123.0	113.8	105.2	119.1	..
As a percent of total time¹	1961	14.0	14.3	13.8	14.1	14.1	13.7	14.1	13.9	14.0	14.2	14.1	14.1
	1971	13.6	14.3	13.4	13.8	13.7	13.7	13.6	13.6	13.6	13.7	13.7	14.2
	1981	13.3	14.1	13.5	13.6	13.8	13.4	13.1	13.3	13.5	13.1	13.3	13.3
	1986	12.7	13.3	12.7	12.9	13.1	12.8	12.4	12.6	12.8	12.6	12.8	12.5
	1992	13.3	14.0	13.2	13.5	13.6	13.5	13.1	13.2	13.3	13.1	13.3	13.3
Per person (hours per year)	1961	1 223	1 253	1 208	1 234	1 237	1 201	1 231	1 219	1 226	1 240	1 234	1 235
	1971	1 195	1 254	1 177	1 207	1 201	1 196	1 187	1 187	1 194	1 201	1 204	1 246
	1981	1 165	1 231	1 181	1 190	1 207	1 178	1 150	1 163	1 180	1 143	1 168	1 166
	1986	1 108	1 163	1 113	1 126	1 143	1 120	1 087	1 105	1 120	1 102	1 126	1 099
	1992	1 164	1 229	1 161	1 183	1 189	1 179	1 150	1 159	1 167	1 146	1 163	1 164
Women's share (%)	1961	67.8	66.7	67.3	67.6	67.7	68.1	68.0	67.2	66.6	66.7	66.9	64.5
	1971	67.5	67.3	66.7	67.5	67.4	67.5	67.5	67.0	66.6	66.7	67.1	65.6
	1981	68.6	66.6	66.4	66.9	66.8	66.9	66.6	66.4	66.2	65.0	68.0	64.3
	1986	68.2	67.8	67.8	68.4	68.1	68.4	68.2	68.0	67.7	67.0	67.4	65.3
	1992	65.3	65.1	64.6	65.5	65.2	65.4	65.2	64.7	64.6	64.5	64.5	63.1
Job equivalents² (thousands)	1961	7 504	171	41	302	234	2 077	2 652	386	381	545	703	14
	1971	8 938	201	44	323	254	2 498	3 233	408	377	655	926	19
	1981	10 911	246	54	382	313	2 949	3 657	452	425	959	1 248	26
	1986	10 975	245	54	384	311	2 888	3 919	450	424	967	1 285	26
	1992	12 788	277	58	433	342	3 298	4 717	496	441	1 145	1 545	35
Hours of paid and unpaid work (millions)	1961	26 691	..	..	..	..	..	..	..	..	..	..	..
	1971	31 994	..	..	..	..	..	..	..	..	..	..	..
	1981	39 778	765	166	1 279	1 030	10 224	14 595	1 661	1 577	3 824	4 517	..
	1986	40 886	782	191	1 321	1 048	10 259	15 411	1 701	1 617	3 910	4 646	..
	1992	45 323	846	201	1 436	1 154	11 192	17 158	1 763	1 825	4 377	5 571	..
Annual percentage change	1961-71	1.8	..	..	..	..	..	..	..	..	..	..	..
	1971-81	2.2	..	..	..	..	..	..	..	..	..	..	..
	1981-86	0.6	-0.1	0.6	0.7	0.3	0.1	1.1	0.5	0.5	-0.1	0.6	..
	1986-92	1.7	1.3	0.9	1.4	1.6	1.5	1.8	0.6	0.1	1.9	3.1	..
	1961-92	1.7	..	..	..	..	..	..	..	..	..	..	..
As a percent of total time¹	1961	25.3	..	..	..	..	..	..	..	..	..	..	..
	1971	24.9	..	..	..	..	..	..	..	..	..	..	..
	1981	24.7	22.9	23.7	23.2	23.1	23.8	25.3	24.9	25.5	27.2	24.6	..
	1986	24.0	21.6	23.1	22.6	22.4	23.2	24.9	24.3	24.9	25.4	23.7	..
	1992	24.0	21.9	23.3	22.9	23.4	23.3	24.4	24.0	25.0	25.5	24.4	..
Per person (hours per year)	1961	2 219	..	..	..	..	..	..	..	..	..	..	..
	1971	2 183	..	..	..	..	..	..	..	..	..	..	..
	1981	2 167	2 007	2 078	2 030	2 028	2 083	2 220	2 161	2 235	2 387	2 156	..
	1986	2 106	1 890	2 025	1 979	1 964	2 029	2 181	2 128	2 182	2 229	2 077	..
	1992	2 104	1 914	2 043	2 002	2 048	2 042	2 135	2 102	2 192	2 235	2 140	..
Job equivalents² (thousands)	1961	13 618	..	..	..	..	..	..	..	..	..	..	..
	1971	16 323	..	..	..	..	..	..	..	..	..	..	..
	1981	20 295	400	95	652	526	5 216	7 446	848	805	2 002	2 305	..
	1986	20 860	399	97	674	535	5 234	7 863	868	825	1 995	2 370	..
	1992	23 124	431	103	732	589	5 710	8 754	900	829	2 233	2 842	..

Notes:

1. Total time is 24 hours per day for 365 days of the year and all the study's population.

2. Hours of paid and unpaid work are converted into number of full-year, full-time job equivalents on the basis of 49 work weeks of 40 hours (or 1 960 hours) per year.

Table B.2
Unpaid Work at Opportunity Cost Before Tax, Canada, Provinces and Territories

Summary statistics	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
Unpaid work at opportunity cost before tax (\$ millions)	1961	26 010	450	112	896	642	7 256	9 750	1 217	1 116	1 864	2 651	55
	1971	55 953	951	198	1 738	1 265	15 462	21 636	2 254	1 849	4 011	6 453	139
	1981	169 607	3 515	657	5 170	4 178	47 378	59 169	6 161	5 946	15 852	21 088	492
	1986	225 527	4 799	927	7 407	5 807	60 466	82 506	8 355	7 582	20 166	28 833	678
	1992	374 095	7 597	1 507	11 660	9 144	95 422	146 936	12 693	9 706	31 903	46 263	1 264
As a percent of GDP	1961	63.8	87.9	97.1	83.9	80.1	68.4	58.5	65.9	69.5	57.8	65.6	60.6
	1971	57.5	72.8	77.0	72.8	69.4	63.7	53.3	57.2	53.6	51.5	62.4	49.4
	1981	47.6	72.5	66.2	66.9	67.6	59.2	45.5	47.1	40.0	30.6	47.7	35.9
	1986	44.6	68.8	59.2	58.0	55.6	51.9	40.4	45.0	43.4	35.5	47.7	33.9
	1992	54.2	82.7	68.6	65.5	65.5	60.9	52.4	53.7	46.2	43.5	53.6	43.7
As a percent of wages, salaries and supplementary labour income	1961	122.7	149.1	186.1	139.5	141.6	129.6	110.7	122.5	167.1	131.3	124.5	97.3
	1971	104.1	126.2	135.6	120.8	115.5	112.3	93.2	104.1	139.6	106.8	110.2	90.5
	1981	85.7	122.2	118.2	100.7	105.6	97.2	79.7	86.6	100.9	70.7	82.6	54.8
	1986	82.1	128.1	110.3	98.0	105.3	92.7	72.2	83.1	94.2	73.9	88.4	57.0
	1992	95.5	146.6	123.3	113.5	116.4	105.4	89.6	97.8	97.2	85.3	95.0	72.6
As a percent of personal income	1961	85.1	96.1	106.4	94.8	95.3	91.4	78.8	83.7	99.7	83.6	84.4	83.9
	1971	74.3	82.2	82.5	83.2	79.7	81.4	68.5	71.0	72.9	72.9	78.8	77.0
	1981	57.8	75.1	85.3	64.4	67.7	65.9	54.9	55.2	52.7	50.3	56.5	58.5
	1986	52.8	71.6	58.5	60.5	62.1	58.5	48.8	51.1	50.1	48.4	54.9	55.9
	1992	60.2	76.4	66.4	68.0	69.0	64.8	59.0	57.9	52.6	54.7	59.2	61.0
As a percent of personal expenditure on goods and services	1961	99.1	103.7	97.1	102.1	101.0	106.9	95.1	97.2	98.8	96.5	100.5	109.0
	1971	99.4	95.4	83.2	98.7	93.8	109.3	96.6	93.4	95.7	93.4	96.9	101.0
	1981	86.5	98.4	87.6	87.6	93.4	101.1	82.1	79.9	83.0	74.8	82.4	85.7
	1986	75.8	89.6	82.2	80.0	84.1	84.1	71.8	71.2	72.4	69.0	76.1	82.7
	1992	88.5	106.7	97.0	94.1	95.8	96.5	88.2	63.5	73.7	78.2	82.7	101.5
Per person (\$ per year)	1961	2 163	1 686	1 671	1 675	1 733	2 140	2 309	1 961	1 832	2 165	2 373	2 510
	1971	3 817	3 026	2 710	3 308	3 054	3 777	4 053	3 342	2 988	3 752	4 280	4 664
	1981	9 242	8 992	7 353	8 207	8 221	9 654	8 998	8 089	8 426	9 642	10 066	11 095
	1986	11 618	11 606	9 640	11 099	10 881	11 960	11 678	10 454	10 229	11 492	11 994	13 484
	1992	17 367	17 197	15 293	16 262	16 235	17 410	18 280	15 132	13 093	18 292	17 773	21 328
Women's share (%)	1961	57.3	53.0	80.8	58.0	57.3	59.5	56.4	56.4	61.2	56.5	54.3	53.5
	1971	58.2	55.6	60.0	58.9	57.9	59.5	57.6	58.5	62.3	58.1	56.4	56.6
	1981	58.7	58.1	61.8	59.8	59.0	60.5	57.9	59.9	61.5	56.9	58.7	58.2
	1986	60.9	60.0	63.3	61.1	60.4	61.0	60.8	62.0	64.8	61.0	59.4	60.5
	1992	58.2	56.1	58.7	57.7	56.5	58.3	58.6	58.9	60.2	57.3	57.2	59.9
Unpaid work at 1986 opportunity cost before tax (\$ millions)	1961	153 835	3 350	714	5 843	4 364	43 517	55 862	7 171	6 832	11 140	14 711	330
	1971	163 929	3 940	782	6 259	4 748	52 449	68 211	7 596	6 756	13 396	19 356	457
	1981	225 284	4 823	936	7 425	5 865	62 030	81 637	8 423	7 622	19 693	26 195	636
	1986	225 527	4 799	927	7 407	5 807	60 466	82 506	8 355	7 582	20 166	28 833	678
	1992	265 630	5 473	1 018	8 443	6 439	69 727	100 296	9 288	7 935	23 553	32 607	850
Volume index (1986=100)	1961	68.2	69.8	77.0	78.9	75.2	72.0	67.7	85.8	90.1	55.2	54.8	48.6
	1971	81.6	82.1	82.2	84.5	81.8	86.7	82.7	90.9	89.1	66.4	72.1	67.3
	1981	99.9	100.5	101.0	100.2	101.0	102.6	99.0	100.6	100.5	97.7	97.6	93.8
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	117.8	114.0	109.8	114.0	110.9	115.3	121.6	111.2	104.7	116.8	121.5	125.3
Implicit price index (1986=100)	1961	16.9	13.4	15.6	15.4	14.7	16.7	17.4	17.0	16.3	16.7	18.0	16.5
	1971	30.4	24.1	26.0	27.7	26.6	29.5	31.7	29.7	27.4	29.9	33.3	30.5
	1981	75.3	72.9	70.2	69.6	71.2	76.4	72.5	73.2	76.0	80.5	80.5	77.3
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	140.8	138.6	148.0	138.1	142.0	136.8	146.5	138.7	122.3	135.4	141.9	148.7
Annual percentage change	1961-71	1.8	1.6	0.7	0.7	0.8	1.9	2.0	0.6	-0.1	1.9	2.6	3.3
	1971-81	2.0	2.0	2.1	1.7	2.1	1.7	1.8	1.0	1.2	3.9	3.1	3.4
	1981-86	0.0	-0.1	-0.2	-0.1	-0.2	-0.5	0.2	-0.2	-0.1	0.5	0.5	1.3
	1986-92	2.8	2.2	1.6	2.2	1.7	2.4	3.3	1.8	0.8	2.6	3.3	3.8
	1961-92	1.8	1.6	1.1	1.2	1.3	1.5	1.9	0.6	0.5	2.4	2.6	3.1

Table B.3
Unpaid Work at Opportunity Cost After Tax, Canada, Provinces and Territories

Summary statistics	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
Unpaid work at opportunity cost after tax (\$ millions)	1961	21 435	382	95	763	546	5 947	8 019	1 004	921	1 532	2 180	45
	1971	39 443	686	142	1 267	902	10 869	15 296	1 541	1 328	2 762	4 554	97
	1981	111 531	2 392	437	3 456	2 882	28 550	40 290	4 101	4 022	10 856	14 209	334
	1986	141 384	3 064	596	4 665	3 728	33 933	53 082	5 301	4 871	13 577	18 117	450
	1992	221 101	4 694	943	7 298	5 716	51 166	90 264	7 717	5 992	17 881	28 621	809
As a percent of GDP	1961	52.4	74.7	82.7	71.3	68.2	56.1	48.1	54.4	57.4	47.5	54.0	49.8
	1971	40.5	52.5	55.2	53.1	49.5	44.8	37.7	39.1	38.5	35.5	44.0	34.3
	1981	31.3	49.4	44.0	44.7	46.7	35.7	31.0	31.3	27.0	21.0	32.1	24.4
	1986	26.0	44.0	38.0	35.2	35.7	29.1	26.0	28.5	27.9	23.9	32.2	22.5
	1992	32.0	51.1	43.0	41.0	40.9	32.6	32.2	32.7	28.5	24.4	33.1	27.9
As a percent of wages, salaries and supplementary labour income	1961	101.2	126.6	158.5	118.5	120.5	106.2	91.1	101.1	137.9	107.9	102.4	80.1
	1971	73.4	91.0	97.2	88.1	82.4	78.9	65.9	71.2	100.3	73.4	77.8	62.8
	1981	56.4	83.2	78.5	67.3	72.9	58.6	54.2	57.6	68.3	48.4	55.7	37.1
	1986	51.5	81.8	70.9	61.7	67.6	52.0	46.5	52.8	60.5	49.8	59.7	37.9
	1992	56.5	90.6	77.2	71.1	72.7	56.5	55.0	59.5	60.0	47.8	58.8	46.4
As a percent of personal income	1961	70.1	83.3	90.8	80.5	81.1	75.0	64.8	69.0	82.3	68.7	69.4	69.0
	1971	52.4	59.3	59.1	60.8	56.9	57.2	48.5	48.5	52.3	50.2	55.6	53.4
	1981	38.0	51.1	43.4	43.1	46.7	39.7	37.4	36.7	35.6	34.5	38.1	39.8
	1986	33.1	45.7	37.6	38.1	39.9	32.9	31.4	32.4	32.2	32.6	37.1	37.1
	1992	35.6	47.2	41.5	42.5	43.1	34.6	36.2	35.2	32.5	30.7	36.6	39.0
As a percent of personal expenditure on goods and services	1961	81.7	88.1	82.7	86.7	88.0	87.6	78.2	80.2	81.5	79.3	82.6	89.7
	1971	70.1	68.8	59.6	70.6	66.9	76.8	68.5	63.9	68.7	64.3	69.8	70.0
	1981	56.9	67.0	58.2	58.5	64.4	60.9	55.9	53.2	56.1	51.3	55.5	58.2
	1986	47.5	57.2	52.8	50.4	54.0	47.2	46.2	45.2	46.5	46.5	51.4	54.9
	1992	52.3	65.9	60.7	58.9	59.6	51.8	54.2	50.7	45.5	43.9	51.2	64.9
Per person (\$ per year)	1961	1 782	1 432	1 423	1 593	1 475	1 754	1 899	1 618	1 512	1 779	1 951	2 064
	1971	2 691	2 183	1 942	2 414	2 179	2 655	2 865	2 286	2 146	2 584	3 020	3 234
	1981	6 077	6 119	4 885	5 486	5 671	5 818	6 127	5 385	5 700	6 603	6 782	7 535
	1986	7 283	7 410	6 326	6 990	6 986	6 712	7 513	6 633	6 571	7 738	8 098	8 952
	1992	10 265	10 626	9 572	10 178	10 148	9 335	11 230	9 200	8 083	9 131	10 995	13 646
Women's share (%)	1961	57.9	53.7	61.6	58.6	58.0	60.2	57.0	56.3	61.0	57.3	55.0	54.2
	1971	58.5	55.7	60.8	58.9	58.1	60.0	57.8	59.0	62.4	58.0	56.6	55.9
	1981	57.6	56.9	62.9	59.1	57.8	60.6	56.0	59.2	60.2	55.8	55.7	56.9
	1986	61.0	61.1	63.8	62.2	61.5	63.3	60.3	63.1	65.8	58.9	57.8	59.2
	1992	60.3	56.1	58.7	57.7	56.5	61.8	60.5	58.1	60.2	61.7	58.9	60.9
Unpaid work at 1986 opportunity cost after tax (\$ millions)	1961	96 024	2 138	459	3 678	2 901	24 414	35 941	4 548	4 367	7 503	9 936	219
	1971	114 843	2 515	490	3 940	3 047	29 408	43 891	4 817	4 338	9 022	13 071	303
	1981	141 057	3 077	801	4 672	3 763	34 759	52 541	5 340	4 893	13 284	17 705	422
	1986	141 384	3 064	596	4 665	3 728	33 933	53 082	5 301	4 871	13 577	18 117	450
	1992	166 658	3 489	654	5 309	4 128	39 012	64 570	5 883	5 091	15 896	22 062	565
Volume index (1986=100)	1961	67.9	69.8	77.0	78.8	75.1	72.0	67.7	85.8	90.1	55.3	54.8	48.8
	1971	81.2	82.1	82.2	84.5	81.7	86.7	82.7	90.9	89.1	68.5	72.2	67.3
	1981	99.8	100.4	100.9	100.2	100.9	102.4	99.0	100.7	100.5	97.8	97.7	93.8
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	117.9	113.9	109.7	113.8	110.7	115.0	121.6	111.0	104.5	117.1	121.8	125.5
Implicit price index (1986=100)	1961	22.3	17.9	20.7	20.8	19.5	24.4	22.3	22.1	21.0	20.4	21.9	20.5
	1971	34.4	27.3	29.0	32.1	29.6	37.0	34.9	32.0	30.6	30.6	34.8	31.9
	1981	79.1	77.7	72.8	74.0	76.6	82.1	76.7	76.8	82.2	81.7	80.3	79.0
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	132.7	134.5	144.2	137.5	136.5	131.2	139.8	131.2	117.7	112.5	129.7	143.1
Annual percentage change	1961-71	1.8	1.6	0.7	0.7	0.8	1.9	2.0	0.6	-0.1	1.9	2.8	3.3
	1971-81	2.1	2.0	2.1	1.7	2.1	1.7	1.8	1.0	1.2	3.9	3.1	3.4
	1981-86	0.1	-0.1	-0.2	-0.0	-0.2	-0.5	0.2	-0.1	-0.1	0.4	0.5	1.3
	1986-92	2.8	2.2	1.6	2.2	1.7	2.4	3.3	1.8	0.7	2.7	3.3	3.9
	1961-92	1.8	1.6	1.1	1.2	1.3	1.5	1.9	0.8	0.5	2.5	2.6	3.1

Table B.4

Unpaid Work at Replacement Cost (Specialist), Canada, Provinces and Territories

Summary statistics	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
Unpaid work at replacement cost (specialist) (\$ millions)	1961	22 739	419	105	744	547	6 298	8 387	1 092	1 039	1 729	2 330	47
	1971	48 775	878	187	1 447	1 084	13 521	18 454	2 000	1 728	3 719	5 641	119
	1981	140 653	2 695	588	4 183	3 350	37 753	48 777	5 383	5 233	13 794	18 496	402
	1986	189 725	3 723	853	5 874	4 842	50 442	68 827	7 310	7 163	17 293	22 826	572
	1992	296 606	5 545	1 230	8 938	6 925	78 374	117 148	10 336	8 248	24 269	36 645	947
As a percent of GDP	1961	55.6	81.8	91.0	69.5	68.3	59.4	50.3	59.1	64.7	53.7	57.7	52.3
	1971	50.1	67.2	72.6	60.6	59.4	55.7	45.5	50.8	50.1	47.6	54.5	42.0
	1981	39.5	55.6	59.3	54.1	54.2	47.2	37.5	41.1	35.2	26.6	41.8	29.3
	1986	37.5	53.4	54.4	44.4	46.4	43.3	33.7	39.3	41.0	30.4	40.6	28.6
	1992	43.0	60.4	56.0	50.2	49.6	48.7	41.8	43.7	39.3	33.1	42.4	32.8
As a percent of wages, salaries and supplementary labour income	1961	107.3	138.8	174.4	115.6	120.8	112.5	95.2	110.0	155.5	121.8	109.5	84.1
	1971	90.7	116.5	127.8	100.7	99.0	98.2	79.5	92.3	130.5	98.9	96.4	77.0
	1981	71.1	93.7	105.7	81.5	84.7	77.5	65.7	75.7	88.8	61.5	72.5	44.6
	1986	69.0	99.4	101.5	77.7	87.8	77.3	60.2	72.7	89.0	63.4	75.2	48.1
	1992	75.7	107.0	100.6	87.0	88.1	84.3	71.4	79.6	82.6	64.9	75.3	54.4
As a percent of personal income	1961	74.4	91.3	99.7	78.5	81.3	79.4	67.6	75.1	92.8	77.6	74.2	72.4
	1971	64.8	75.9	77.8	89.4	68.3	71.2	58.5	63.0	68.1	67.6	68.9	65.5
	1981	48.0	57.6	58.4	52.1	54.3	52.5	45.2	48.2	46.4	43.8	49.6	47.8
	1986	44.4	55.6	53.8	48.0	51.6	48.8	40.7	44.7	47.3	41.5	46.7	47.1
	1992	47.7	55.7	54.2	52.1	52.2	51.7	47.0	47.1	44.7	41.6	46.9	45.7
As a percent of personal expenditure on goods and services	1961	86.7	96.6	91.0	84.6	88.2	92.8	81.8	87.3	91.9	89.6	88.3	94.2
	1971	86.7	88.1	78.4	80.6	80.3	95.6	82.6	82.8	89.4	86.8	88.4	85.9
	1981	71.7	75.4	78.4	70.9	74.9	60.5	67.7	69.8	73.0	65.1	72.3	70.0
	1986	63.8	69.5	75.6	63.4	70.1	70.2	59.9	62.3	88.4	59.2	64.8	69.8
	1992	70.2	77.9	79.1	72.1	72.4	77.3	70.3	68.0	62.6	59.5	65.5	76.1
Per person (\$ per year)	1961	1 891	1 570	1 566	1 554	1 478	1 858	1 986	1 761	1 705	2 008	2 086	2 168
	1971	3 328	2 794	2 555	2 758	2 816	3 303	3 457	2 965	2 792	3 479	3 741	3 968
	1981	7 664	6 693	6 578	6 641	6 591	7 693	7 418	7 068	7 416	8 390	8 828	9 062
	1986	9 774	9 003	9 051	8 802	9 074	9 977	9 742	9 146	9 664	9 855	10 203	11 374
	1992	13 770	12 552	12 479	12 465	12 295	13 935	14 574	12 322	11 127	12 393	14 078	15 990
Women's share (%)	1961	65.3	65.2	66.3	65.7	66.0	66.3	65.3	64.7	63.9	64.0	64.5	61.8
	1971	65.2	65.9	65.8	65.7	65.8	65.9	65.0	64.7	64.2	64.2	64.8	63.1
	1981	64.5	64.9	65.0	64.5	65.0	65.5	64.3	64.3	64.3	63.0	63.6	63.8
	1986	65.6	66.0	66.4	68.2	66.0	66.0	65.7	66.0	65.5	64.6	65.0	64.4
	1992	63.4	63.7	63.8	63.2	63.7	63.8	63.5	63.7	62.8	63.1	62.5	62.4
Unpaid work at 1986 replacement cost (specialist) (\$ millions)	1961	121 196	2 445	618	4 334	3 386	33 671	43 696	5 976	6 019	6 930	11 656	265
	1971	146 256	2 900	664	4 688	3 731	41 227	53 878	6 382	6 018	10 865	15 536	368
	1981	180 990	3 596	824	5 625	4 654	49 268	65 190	7 127	6 840	16 105	21 246	516
	1986	189 725	3 723	853	5 874	4 842	50 442	68 827	7 310	7 163	17 293	22 826	572
	1992	215 141	4 163	904	6 469	5 207	56 068	80 410	7 910	7 192	19 458	26 672	689
Volume index (1986=100)	1981	63.9	65.7	72.5	73.8	69.9	67.2	63.5	81.8	84.0	51.6	51.1	46.3
	1971	77.1	77.9	77.9	79.8	77.0	81.7	78.3	87.3	84.0	62.6	68.1	64.3
	1981	95.4	96.6	96.8	95.8	96.1	97.7	94.7	97.5	95.5	93.1	93.1	90.1
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	113.4	111.8	106.0	110.1	107.5	111.2	116.6	108.2	100.4	112.5	116.8	120.5
Implicit price index (1986=100)	1961	18.8	17.1	16.9	17.2	16.2	18.6	19.2	18.3	17.3	19.4	20.0	17.8
	1971	33.4	30.3	28.1	30.9	29.0	32.6	34.2	31.3	26.7	34.2	36.3	32.2
	1981	77.7	74.9	71.4	74.4	72.0	76.6	74.8	75.5	76.5	85.7	87.0	77.9
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	137.9	133.2	136.0	138.2	133.0	136.2	145.7	130.7	114.7	124.7	137.4	137.4
Annual percentage change	1961-71	1.9	1.7	0.7	0.8	1.0	2.0	2.1	0.7	0.0	2.0	2.9	3.3
	1971-81	2.1	2.2	2.2	1.8	2.2	1.8	1.9	1.1	1.3	4.0	3.2	3.4
	1981-86	0.9	0.7	0.7	0.9	0.8	0.5	1.1	0.5	0.9	1.4	1.4	2.1
	1986-92	2.1	1.9	1.0	1.6	1.2	1.8	2.6	1.3	0.1	2.0	2.8	3.2
	1961-92	1.9	1.7	1.2	1.3	1.4	1.6	2.0	0.9	0.6	2.5	2.7	3.1

Table B.5
Unpaid Work at Replacement Cost (Generalist), Canada, Provinces and Territories

Summary statistics	Year	Canada	Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.	B.C.	Yuk. & N.W.T.
Unpaid work at replacement cost (generalist) (\$ millions)	1961	13 988	212	49	389	281	3 699	5 234	737	644	1 145	1 549	49
	1971	29 662	439	85	746	547	7 810	11 374	1 336	1 057	2 432	3 714	122
	1981	90 985	1 713	433	2 712	1 861	22 592	31 758	3 300	3 543	10 287	12 511	274
	1986	132 253	2 810	582	4 020	3 859	36 394	45 951	6 062	4 308	13 254	14 660	351
	1992	234 482	3 636	1 270	7 478	4 740	57 373	92 478	8 636	6 278	20 659	31 173	763
As a percent of GDP	1961	34.2	41.4	42.2	36.3	35.1	34.9	31.4	39.9	40.1	35.5	38.3	54.2
	1971	30.5	33.6	33.2	31.3	30.0	32.2	28.0	34.0	30.6	31.2	35.9	43.4
	1981	25.6	35.4	43.7	35.1	30.1	28.2	24.4	25.2	23.8	19.9	28.3	20.0
	1986	26.1	40.3	37.1	30.4	36.9	31.2	22.5	32.6	24.7	23.3	26.1	17.6
	1992	34.0	39.6	57.8	42.0	33.9	36.6	33.0	36.5	29.9	28.2	36.1	26.4
As a percent of wages, salaries and supplementary labour income	1961	66.0	70.2	80.9	60.4	62.1	66.1	59.4	74.3	96.5	80.6	72.7	87.1
	1971	55.2	58.2	58.4	51.9	49.9	56.7	49.0	61.7	79.8	64.6	63.5	79.5
	1981	46.0	59.6	78.0	52.8	47.1	46.4	42.8	46.4	60.1	45.9	49.0	30.4
	1986	48.1	75.0	69.3	53.2	70.0	55.8	40.2	60.3	53.5	48.6	48.3	29.5
	1992	59.9	70.2	104.0	72.8	60.3	63.4	56.4	66.5	62.9	55.3	64.0	43.8
As a percent of personal income	1961	45.8	46.2	46.2	41.0	41.8	46.6	42.3	50.7	57.6	51.4	49.3	75.0
	1971	39.4	37.9	35.5	35.8	34.4	41.1	36.0	42.1	41.6	44.2	45.4	67.6
	1981	31.0	36.6	43.1	33.8	30.2	31.4	29.4	29.6	31.4	32.6	33.5	32.6
	1986	30.9	42.0	36.8	32.9	41.3	35.2	27.2	37.0	28.5	31.8	30.0	28.9
	1992	37.7	36.5	56.0	43.6	35.7	38.9	37.1	39.4	34.0	35.4	39.9	36.8
As a percent of personal expenditure on goods and services	1961	53.3	48.9	42.2	44.2	44.3	54.5	51.1	58.9	57.0	59.3	58.7	97.5
	1971	52.7	44.0	35.9	41.6	40.5	55.2	50.9	55.4	54.7	56.6	56.9	88.7
	1981	46.4	47.9	57.8	46.0	41.6	48.2	44.1	42.8	49.4	48.6	48.9	47.7
	1986	44.5	52.5	51.6	43.4	55.9	50.6	40.0	51.6	41.1	45.4	41.6	42.8
	1992	55.5	51.0	81.7	60.3	49.6	58.0	55.5	56.6	47.6	50.7	55.8	61.3
Per person (\$ per year)	1961	1 163	795	726	812	760	1 091	1 239	1 189	1 057	1 329	1 386	2 244
	1971	2 024	1 396	1 168	1 422	1 320	1 908	2 131	1 982	1 708	2 275	2 464	4 095
	1981	4 958	4 381	4 849	4 305	3 683	4 604	4 830	4 333	5 020	8 257	5 972	6 181
	1986	6 813	6 796	6 179	6 024	7 232	7 199	6 504	7 584	5 812	7 554	6 553	6 981
	1992	10 886	8 230	12 890	10 429	8 415	10 468	11 505	10 295	8 469	10 550	11 976	12 872
Women's share (%)	1961	67.5	66.9	67.3	67.1	68.3	68.5	67.7	66.5	66.3	66.3	66.3	63.3
	1971	67.2	67.5	66.8	67.1	68.0	68.0	67.2	66.4	66.4	66.4	66.6	64.5
	1981	66.3	65.9	66.0	66.7	66.5	67.1	66.5	66.5	66.2	64.9	65.8	64.1
	1986	67.8	67.5	67.5	68.2	67.8	68.2	68.0	67.9	67.7	66.8	67.2	65.5
	1992	65.0	64.7	64.5	65.2	65.1	65.4	65.2	64.7	64.5	64.3	64.2	62.9
Unpaid work at 1986 replacement cost (generalist) (\$ millions)	1961	88 398	1 916	436	3 082	2 824	25 519	30 391	5 122	3 843	7 201	7 895	168
	1971	105 670	2 260	467	3 314	3 088	30 828	37 142	5 438	3 796	8 688	10 416	234
	1981	129 805	2 779	577	3 951	3 836	36 578	44 557	6 044	4 277	12 779	14 103	324
	1986	132 253	2 810	582	4 020	3 859	38 394	45 951	6 062	4 308	13 254	14 660	351
	1992	152 825	3 177	632	4 513	4 248	41 247	54 628	6 657	4 436	15 339	17 516	432
Volume index (1986=100)	1961	66.8	68.2	75.0	76.7	73.2	70.1	66.1	84.5	89.2	54.3	53.9	47.9
	1971	79.9	80.4	80.2	82.4	80.0	84.7	80.8	89.7	88.1	65.5	71.0	66.6
	1981	98.2	98.9	99.1	98.3	99.4	100.5	97.0	99.7	99.3	96.4	96.2	92.2
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	115.6	113.0	108.6	112.3	110.1	113.3	118.9	109.6	103.0	115.7	119.5	123.0
Implicit price index (1986=100)	1961	15.8	11.1	11.1	12.6	10.0	14.5	17.2	14.4	16.8	15.9	19.6	29.0
	1971	28.1	19.4	18.3	22.5	17.7	25.3	30.6	24.6	27.8	28.0	35.7	52.4
	1981	70.1	61.6	75.1	68.6	48.5	61.8	71.3	54.6	82.8	80.5	88.7	84.6
	1986	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	1992	153.4	114.4	200.9	165.7	111.6	139.1	169.3	129.7	141.5	134.7	178.0	176.6
Annual percentage change	1961-71	1.8	1.7	0.7	0.7	0.9	1.9	2.0	0.6	-0.1	1.9	2.8	3.3
	1971-81	2.1	2.1	2.1	1.8	2.2	1.7	1.6	1.1	1.2	3.9	3.1	3.3
	1981-86	0.4	0.2	0.2	0.3	0.1	-0.1	0.6	0.1	0.1	0.7	0.8	1.6
	1986-92	2.4	2.1	1.4	1.9	1.6	2.1	2.9	1.6	0.5	2.5	3.0	3.5
	1961-92	1.8	1.6	1.2	1.2	1.3	1.6	1.9	0.8	0.5	2.5	2.6	3.1

Table C.1
Hours of Unpaid Work by Activity

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of hours							
All persons (15+)	1961	14 709	13 897	8 320	2 384	1 803	1 390
	1971	17 519	16 524	9 875	2 654	2 285	1 731
	1981	21 386	20 184	12 155	2 887	2 951	2 172
	1986	21 511	20 348	11 973	2 408	3 800	2 168
	1992	25 064	23 618	14 704	2 770	3 648	2 497
Employed	1961	5 070	4 738	2 510	739	811	678
	1971	7 281	6 831	3 684	1 042	1 165	939
	1981	10 312	9 714	5 361	1 412	1 643	1 298
	1986	10 298	9 750	5 387	1 200	1 986	1 176
	1992	12 362	11 757	6 931	1 560	1 853	1 413
Not employed	1961	9 639	9 158	5 810	1 645	992	712
	1971	10 238	9 694	6 191	1 612	1 100	791
	1981	11 074	10 450	6 793	1 475	1 307	874
	1986	11 213	10 599	6 586	1 207	1 813	993
	1992	12 703	11 861	7 773	1 209	1 795	1 084
Females (15+)	1961	9 951	9 507	5 960	1 777	1 063	708
	1971	11 797	11 247	7 025	1 976	1 338	908
	1981	14 216	13 529	8 486	2 130	1 759	1 154
	1986	14 625	13 891	8 745	1 763	2 169	1 214
	1992	16 313	15 487	9 834	1 988	2 216	1 448
Employed	1961	1 713	1 617	952	222	275	168
	1971	3 284	3 124	1 825	480	494	324
	1981	5 344	5 092	2 982	787	790	534
	1986	5 879	5 573	3 353	691	967	562
	1992	7 043	6 754	4 081	913	1 043	737
Not employed	1961	8 238	7 890	5 008	1 555	787	539
	1971	8 513	8 123	5 200	1 496	844	583
	1981	8 872	8 436	5 504	1 344	969	620
	1986	8 745	8 318	5 392	1 072	1 203	651
	1992	9 271	8 733	5 773	1 075	1 174	711
Males (15+)	1961	4 758	4 389	2 360	607	740	682
	1971	5 722	5 277	2 850	678	927	823
	1981	7 170	6 635	3 669	756	1 192	1 018
	1986	6 886	6 458	3 228	645	1 630	955
	1992	8 751	8 131	4 870	781	1 432	1 049
Employed	1961	3 358	3 121	1 558	518	536	510
	1971	3 997	3 706	1 859	562	671	615
	1981	4 968	4 622	2 380	625	853	784
	1986	4 419	4 177	2 034	509	1 020	614
	1992	5 319	5 008	2 870	647	810	675
Not employed	1961	1 400	1 268	801	89	204	173
	1971	1 725	1 571	991	116	256	208
	1981	2 202	2 014	1 289	131	339	255
	1986	2 467	2 281	1 194	136	611	341
	1992	3 432	3 128	2 000	134	621	373

Table C.1
Hours of Unpaid Work by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of hours							
Wives	1961	7 848	7 575	4 691	1 640	744	501
	1971	8 929	8 607	5 314	1 781	893	618
	1981	10 355	9 956	6 193	1 874	1 128	760
	1986	10 546	10 166	6 439	1 505	1 427	795
	1992	11 413	10 954	6 989	1 683	1 346	937
Employed	1961	1 100	1 056	618	194	142	102
	1971	2 373	2 284	1 328	432	304	221
	1981	3 894	3 747	2 186	703	497	361
	1986	4 213	4 089	2 503	584	645	357
	1992	5 162	5 004	3 066	811	640	487
With children	1961	725	708	386	180	80	63
	1971	1 625	1 590	861	404	182	143
	1981	2 636	2 579	1 394	657	293	234
	1986	2 841	2 763	1 618	523	392	232
	1992	3 426	3 365	1 858	800	384	323
Not employed	1961	6 747	6 519	4 072	1 445	602	399
	1971	6 556	6 322	3 987	1 350	589	397
	1981	6 461	6 209	4 008	1 171	631	399
	1986	6 333	6 077	3 936	921	782	438
	1992	6 251	5 950	3 922	872	706	449
With children	1961	5 188	5 046	2 929	1 382	420	315
	1971	4 827	4 689	2 729	1 283	378	299
	1981	4 061	3 939	2 275	1 062	325	257
	1986	3 421	3 323	1 873	828	374	247
	1992	3 018	2 908	1 602	829	272	204
Husbands	1961	3 441	3 225	1 719	575	473	459
	1971	4 125	3 855	2 069	637	593	557
	1981	5 151	4 817	2 654	713	754	696
	1986	4 998	4 694	2 293	594	1 152	655
	1992	6 483	6 101	3 562	741	1 010	788
Employed	1961	2 670	2 493	1 244	499	362	388
	1971	3 102	2 885	1 448	536	442	458
	1981	3 751	3 499	1 801	598	542	559
	1986	3 330	3 158	1 482	489	748	436
	1992	4 174	3 988	2 224	625	605	534
With children	1961	2 111	1 963	885	480	292	305
	1971	2 355	2 178	979	511	342	346
	1981	2 656	2 462	1 125	561	384	391
	1986	2 250	2 142	902	482	454	304
	1992	2 847	2 722	1 406	616	367	333
Not employed	1961	771	733	475	76	111	71
	1971	1 023	970	621	101	150	99
	1981	1 399	1 318	853	116	212	137
	1986	1 668	1 538	811	105	403	218
	1992	2 308	2 113	1 338	116	405	254
With children	1961	266	258	145	48	39	29
	1971	383	371	210	63	56	42
	1981	376	364	208	59	56	41
	1986	449	430	220	86	75	49
	1992	573	554	307	95	88	64

Table C.1
Hours of Unpaid Work by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of hours							
Female lone parents	1961	466	449	293	71	54	32
	1971	677	654	416	116	73	48
	1981	1 024	989	611	180	120	77
	1986	1 129	1 089	678	172	151	89
	1992	1 434	1 379	841	258	171	109
Male lone parents	1961	72	65	38	9	9	9
	1971	100	92	52	16	12	12
	1981	125	114	66	18	17	16
	1986	151	137	78	20	20	19
	1992	167	150	86	22	22	20
Female children (15+)	1961	639	553	329	34	110	80
	1971	848	737	430	44	153	110
	1981	972	851	487	43	190	131
	1986	964	808	456	40	203	109
	1992	994	883	472	19	241	151
Male children (15+)	1961	656	559	260	8	147	144
	1971	799	686	318	10	187	171
	1981	886	766	355	11	214	186
	1986	710	669	359	19	179	113
	1992	768	659	391	10	158	100
Females living alone	1961	288	268	195	-	45	27
	1971	568	526	378	-	94	54
	1981	1 129	1 046	738	-	199	108
	1986	1 319	1 211	807	-	271	132
	1992	1 605	1 450	1 016	-	293	141
Males living alone	1961	158	150	94	-	35	21
	1971	265	252	157	-	60	35
	1981	544	517	318	-	127	71
	1986	587	531	309	-	141	80
	1992	849	764	511	-	162	91
Other females	1961	709	663	452	32	111	68
	1971	775	724	487	35	124	78
	1981	737	687	456	32	121	78
	1986	667	617	364	47	118	68
	1992	868	821	517	28	166	111
Other males	1961	431	390	250	15	76	49
	1971	434	393	255	15	75	48
	1981	464	421	276	16	79	49
	1986	441	428	189	12	139	88
	1992	484	456	320	9	79	49

Note:

1. See footnotes to Table A.1.

Table C.2
Unpaid Work at Opportunity Cost Before Tax by Activity

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
All persons (15+)	1961	26 010	24 486	14 440	4 074	3 319	2 652
	1971	55 953	52 619	31 048	8 216	7 484	5 871
	1981	169 607	159 577	95 280	22 303	23 966	18 028
	1986	225 527	213 140	123 458	24 790	41 264	23 628
	1992	374 095	351 978	218 264	40 459	55 180	38 075
Employed	1961	10 442	9 746	5 089	1 544	1 667	1 446
	1971	25 517	23 882	12 705	3 633	4 122	3 422
	1981	86 041	80 892	44 187	11 807	13 886	11 212
	1986	111 908	105 916	57 598	13 009	22 180	13 150
	1992	189 229	179 706	105 591	23 748	28 432	21 936
Not employed	1961	15 568	14 741	9 351	2 531	1 652	1 206
	1971	30 437	28 737	18 344	4 583	3 362	2 448
	1981	83 566	78 685	51 094	10 696	10 080	6 816
	1986	113 619	107 224	65 860	11 781	19 104	10 478
	1992	184 866	172 271	112 673	16 710	26 749	16 139
Females (15+)	1961	14 899	14 235	8 925	2 658	1 593	1 060
	1971	32 580	31 062	19 405	5 449	3 698	2 509
	1981	99 566	94 754	59 429	14 922	12 322	8 080
	1986	137 297	130 405	82 092	16 547	20 370	11 397
	1992	217 592	206 566	131 169	26 498	29 578	19 322
Employed	1961	2 579	2 435	1 434	333	415	253
	1971	9 123	8 678	5 072	1 331	1 374	901
	1981	37 414	35 652	20 877	5 499	5 536	3 740
	1986	55 279	52 396	31 523	6 498	9 089	5 287
	1992	94 116	90 248	54 270	12 179	13 943	9 855
Not employed	1961	12 320	11 800	7 491	2 325	1 178	806
	1971	23 457	22 383	14 333	4 118	2 325	1 607
	1981	62 152	59 102	38 551	9 423	6 786	4 341
	1986	82 018	78 010	50 569	10 050	11 280	6 109
	1992	123 475	116 318	78 898	14 319	15 635	9 466
Males (15+)	1961	11 111	10 251	5 516	1 417	1 727	1 592
	1971	23 373	21 557	11 643	2 766	3 786	3 362
	1981	70 042	64 824	35 852	7 381	11 644	9 947
	1986	88 230	82 735	41 367	8 244	20 894	12 231
	1992	156 504	145 412	87 095	13 960	25 602	18 753
Employed	1961	7 864	7 311	3 655	1 211	1 252	1 193
	1971	16 394	15 204	7 632	2 301	2 749	2 521
	1981	48 628	45 240	23 309	6 108	8 350	7 472
	1986	56 629	53 520	26 076	6 513	13 070	7 862
	1992	95 113	89 459	51 321	11 569	14 489	12 080
Not employed	1961	3 247	2 940	1 860	206	475	400
	1971	6 979	6 354	4 011	465	1 037	841
	1981	21 414	19 584	12 542	1 273	3 294	2 475
	1986	31 601	29 214	15 291	1 731	7 823	4 369
	1992	61 391	55 953	35 775	2 392	11 114	6 673

Table C.2

Unpaid Work at Opportunity Cost Before Tax by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Wives	1961	11 750	11 342	7 023	2 453	1 115	750
	1971	24 659	23 768	14 679	4 912	2 469	1 707
	1981	72 516	69 724	43 373	13 127	7 899	5 325
	1986	98 987	95 418	60 440	14 120	13 392	7 466
	1992	152 186	146 064	93 195	22 433	17 945	12 492
Employed	1961	1 656	1 590	931	292	214	154
	1971	6 591	6 344	3 689	1 196	845	613
	1981	27 247	26 218	15 296	4 916	3 476	2 529
	1986	39 590	38 430	23 526	5 485	6 061	3 358
	1992	68 909	66 799	40 931	10 820	8 543	6 506
With children	1961	1 089	1 064	580	271	119	94
	1971	4 506	4 409	2 388	1 119	504	398
	1981	18 413	18 014	9 741	4 593	2 048	1 633
	1986	26 680	25 950	15 180	4 914	3 678	2 179
	1992	45 695	44 874	24 773	10 672	5 124	4 305
Not employed	1961	10 094	9 752	6 093	2 181	902	596
	1971	18 068	17 424	10 991	3 716	1 624	1 094
	1981	45 269	43 506	28 076	8 211	4 422	2 796
	1986	59 396	56 988	36 914	8 635	7 331	4 108
	1992	83 278	79 265	52 264	11 813	9 402	5 985
With children	1961	7 756	7 543	4 378	2 066	629	471
	1971	13 268	12 906	7 513	3 530	1 039	824
	1981	28 472	27 622	15 950	7 590	2 279	1 802
	1986	32 061	31 145	17 555	7 767	3 508	2 315
	1992	40 126	38 665	21 296	11 039	3 615	2 715
Husbands	1961	8 050	7 546	4 022	1 343	1 106	1 075
	1971	16 866	15 762	8 460	2 599	2 425	2 279
	1981	50 295	47 041	25 917	6 954	7 366	6 804
	1986	64 022	60 127	29 384	7 596	14 758	8 389
	1992	115 953	109 129	83 721	13 245	18 071	14 091
Employed	1961	6 263	5 848	2 921	1 168	849	910
	1971	12 728	11 840	5 948	2 195	1 817	1 880
	1981	36 682	34 216	17 615	5 826	5 305	5 470
	1986	42 661	40 432	18 994	6 256	9 591	5 590
	1992	74 623	71 298	39 756	11 173	10 825	9 542
With children	1961	4 940	4 594	2 071	1 123	685	715
	1971	9 646	8 919	4 008	2 092	1 403	1 416
	1981	25 935	24 037	10 989	5 474	3 752	3 823
	1986	28 796	27 415	11 548	6 168	5 814	3 885
	1992	50 865	48 625	25 114	11 008	6 561	5 942
Not employed	1961	1 788	1 699	1 102	175	257	165
	1971	4 138	3 922	2 512	403	608	399
	1981	13 613	12 825	8 302	1 128	2 062	1 334
	1986	21 362	19 696	10 390	1 340	5 167	2 799
	1992	41 330	37 831	23 963	2 072	7 248	4 550
With children	1961	606	589	330	104	90	65
	1971	1 526	1 478	836	252	224	166
	1981	3 630	3 513	2 011	566	540	396
	1986	5 736	5 485	2 808	1 101	954	823
	1992	10 232	9 900	5 491	1 693	1 568	1 147

Table C.2
Unpaid Work at Opportunity Cost Before Tax by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Female lone parents	1961	694	669	436	105	80	47
	1971	1 868	1 803	1 146	321	202	134
	1981	7 178	6 935	4 287	1 265	842	540
	1986	10 601	10 231	6 364	1 611	1 418	837
	1992	19 113	18 380	11 207	3 441	2 278	1 455
Male lone parents	1961	168	150	87	20	22	21
	1971	406	374	210	66	49	49
	1981	1 219	1 114	641	160	162	151
	1986	1 942	1 758	1 004	254	258	242
	1992	2 984	2 681	1 535	386	396	364
Female children (15+)	1961	956	827	493	51	164	119
	1971	2 332	2 027	1 182	121	422	302
	1981	6 800	5 953	3 405	303	1 332	913
	1986	9 052	7 586	4 280	373	1 907	1 026
	1992	13 282	11 801	6 304	253	3 228	2 015
Male children (15+)	1961	1 512	1 288	599	19	339	331
	1971	3 238	2 779	1 286	41	758	694
	1981	8 624	7 457	3 450	108	2 089	1 810
	1986	9 105	8 572	4 597	237	2 288	1 450
	1992	13 754	11 795	7 000	175	2 829	1 791
Females living alone	1961	434	402	294	-	67	41
	1971	1 580	1 465	1 053	-	262	150
	1981	7 906	7 326	5 170	-	1 397	758
	1986	12 389	11 374	7 584	-	2 547	1 242
	1992	21 385	19 316	13 542	-	3 899	1 875
Males living alone	1961	369	351	221	-	81	49
	1971	1 084	1 030	640	-	246	144
	1981	5 342	5 074	3 122	-	1 250	701
	1986	7 515	6 799	3 958	-	1 812	1 029
	1992	15 125	13 624	9 102	-	2 895	1 627
Other females	1961	1 064	995	879	48	166	102
	1971	2 141	1 999	1 345	95	344	215
	1981	5 165	4 816	3 194	227	852	543
	1986	6 267	5 798	3 423	443	1 105	626
	1992	11 626	11 005	6 920	372	2 227	1 485
Other males	1961	1 012	915	586	34	179	116
	1971	1 780	1 613	1 048	61	308	196
	1981	4 561	4 138	2 721	159	776	481
	1986	5 645	5 479	2 423	156	1 778	1 121
	1992	8 687	8 183	5 737	155	1 411	880

Note:

1. See footnotes to Table A.1.

Table C.3
Unpaid Work at Opportunity Cost After Tax by Activity

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
All persons (15+)	1961	21 435	20 184	11 914	3 364	2 729	2 176
	1971	39 443	37 096	21 898	5 797	5 270	4 131
	1981	111 531	104 904	62 545	14 607	15 819	11 933
	1986	141 384	133 624	77 403	15 554	25 859	14 808
	1992	221 101	208 128	129 212	24 074	32 483	22 359
Employed	1961	8 530	7 962	4 161	1 260	1 362	1 179
	1971	17 939	16 791	8 936	2 554	2 897	2 404
	1981	57 167	53 731	29 315	7 694	9 241	7 482
	1986	70 346	68 581	38 212	8 177	13 928	8 264
	1992	111 123	105 577	62 101	13 968	16 684	12 825
Not employed	1961	12 905	12 222	7 754	2 105	1 367	997
	1971	21 504	20 305	12 962	3 243	2 373	1 727
	1981	54 363	51 173	33 230	6 913	6 578	4 451
	1986	71 038	67 043	41 191	7 377	11 932	6 544
	1992	109 978	102 551	87 111	10 107	15 798	9 534
Females (15+)	1961	12 413	11 859	7 435	2 214	1 327	883
	1971	23 073	21 997	13 743	3 859	2 819	1 776
	1981	64 217	61 114	38 328	9 623	7 951	5 213
	1986	86 208	81 882	51 538	10 397	12 790	7 157
	1992	133 351	126 596	80 379	16 244	18 129	11 845
Employed	1961	2 147	2 027	1 193	277	346	211
	1971	6 456	6 141	3 590	942	972	638
	1981	24 222	23 082	13 517	3 561	3 584	2 421
	1986	34 613	32 998	19 854	4 091	5 724	3 329
	1992	57 810	55 432	33 335	7 478	8 565	6 055
Not employed	1961	10 266	9 832	6 242	1 937	981	672
	1971	16 617	15 856	10 153	2 917	1 647	1 139
	1981	39 995	38 032	24 810	6 062	4 367	2 792
	1986	51 394	48 883	31 685	6 306	7 066	3 827
	1992	75 541	71 164	47 044	8 766	9 564	5 780
Males (15+)	1961	9 022	8 324	4 479	1 150	1 402	1 293
	1971	16 371	15 099	8 155	1 938	2 651	2 355
	1981	47 313	43 790	24 218	4 984	7 868	6 720
	1986	55 177	51 742	25 865	5 157	13 069	7 651
	1992	87 750	81 531	48 834	7 830	14 354	10 514
Employed	1961	6 383	5 934	2 967	983	1 018	968
	1971	11 483	10 650	5 346	1 612	1 925	1 786
	1981	32 945	30 649	15 798	4 133	5 658	5 061
	1986	35 533	33 583	16 359	4 086	8 204	4 935
	1992	53 314	50 145	28 766	6 488	8 120	6 771
Not employed	1961	2 639	2 390	1 512	167	386	325
	1971	4 887	4 449	2 809	326	726	589
	1981	14 368	13 141	8 420	851	2 210	1 659
	1986	19 644	18 160	9 506	1 071	4 866	2 716
	1992	34 436	31 387	20 067	1 342	8 234	3 744

Table C.3
Unpaid Work at Opportunity Cost After Tax by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Wives	1961	9 789	9 448	5 851	2 044	929	625
	1971	17 462	16 831	10 395	3 479	1 748	1 209
	1981	46 794	44 992	27 986	8 468	5 100	3 438
	1986	62 185	59 944	37 965	8 875	8 414	4 690
	1992	93 293	89 541	57 129	13 752	11 001	7 659
Employed	1961	1 379	1 323	775	243	178	128
	1971	4 664	4 489	2 610	847	598	434
	1981	17 644	16 978	9 906	3 183	2 251	1 638
	1986	24 938	24 206	14 820	3 454	3 818	2 115
	1992	42 324	41 029	25 142	6 644	5 246	3 996
With children	1961	907	885	482	225	99	78
	1971	3 188	3 120	1 690	792	356	282
	1981	11 926	11 668	6 311	2 973	1 327	1 058
	1986	16 808	16 348	9 564	3 094	2 317	1 372
	1992	28 058	27 553	15 211	6 553	3 145	2 644
Not employed	1961	6 410	8 125	5 076	1 801	751	497
	1971	12 798	12 342	7 785	2 632	1 150	775
	1981	29 150	28 014	18 080	5 285	2 849	1 800
	1986	37 248	35 738	23 145	5 421	4 596	2 576
	1992	50 968	48 512	31 987	7 108	5 754	3 662
With children	1961	6 463	6 285	3 648	1 721	524	392
	1971	9 412	9 142	5 322	2 500	736	583
	1981	18 315	17 768	10 258	4 885	1 466	1 159
	1986	20 094	19 520	10 996	4 877	2 196	1 451
	1992	24 524	23 632	13 009	6 757	2 208	1 658
Husbands	1961	6 537	6 128	3 268	1 090	898	873
	1971	11 813	11 040	5 926	1 820	1 698	1 596
	1981	33 983	31 782	17 510	4 696	4 977	4 599
	1986	40 042	37 607	18 374	4 755	9 231	5 248
	1992	65 061	61 231	35 756	7 429	10 140	7 905
Employed	1961	5 084	4 747	2 371	948	689	739
	1971	8 916	8 294	4 168	1 538	1 273	1 317
	1981	24 837	23 186	11 930	3 941	3 592	3 704
	1986	26 739	25 342	11 904	3 925	6 009	3 503
	1992	41 835	39 972	22 288	6 267	6 068	5 349
With children	1961	4 010	3 729	1 682	912	556	580
	1971	6 757	6 248	2 808	1 466	983	992
	1981	17 552	16 286	7 438	3 702	2 540	2 587
	1986	18 038	17 174	7 232	3 869	3 640	2 433
	1992	28 516	27 261	14 079	6 174	3 677	3 331
Not employed	1961	1 453	1 381	896	142	209	134
	1971	2 897	2 746	1 759	282	426	279
	1981	9 147	8 616	5 581	754	1 385	896
	1986	13 304	12 265	6 470	830	3 221	1 744
	1992	23 226	21 259	13 467	1 162	4 073	2 557
With children	1961	493	479	268	85	73	53
	1971	1 068	1 034	585	176	157	116
	1981	2 407	2 329	1 333	375	358	262
	1986	3 540	3 385	1 732	680	589	384
	1992	5 738	5 551	3 079	949	879	643

Table C.3

Unpaid Work at Opportunity Cost After Tax by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Female lone parents	1961	579	557	364	88	67	39
	1971	1 323	1 277	812	227	143	95
	1981	4 616	4 460	2 758	815	541	348
	1986	6 631	6 399	3 980	1 010	886	524
	1992	11 688	11 241	6 850	2 109	1 392	890
Male lone parents	1961	136	122	71	16	18	17
	1971	284	262	147	46	34	35
	1981	821	751	431	108	109	102
	1986	1 207	1 093	624	159	180	151
	1992	1 666	1 497	857	218	221	203
Female children (15+)	1961	797	689	411	43	137	99
	1971	1 652	1 436	838	85	299	214
	1981	4 373	3 828	2 189	194	857	587
	1986	5 678	4 756	2 684	234	1 196	643
	1992	6 149	7 240	3 867	154	1 982	1 237
Male children (15+)	1961	1 228	1 046	486	16	276	269
	1971	2 267	1 946	901	29	530	486
	1981	5 805	5 021	2 319	72	1 410	1 219
	1986	5 658	5 327	2 860	147	1 419	901
	1992	7 717	6 618	3 928	98	1 587	1 005
Females living alone	1961	361	335	245	-	56	34
	1971	1 119	1 037	745	-	185	106
	1981	5 106	4 731	3 339	-	902	490
	1986	7 781	7 144	4 763	-	1 600	780
	1992	13 082	11 617	8 284	-	2 385	1 147
Males living alone	1961	300	285	179	-	66	40
	1971	759	721	448	-	172	101
	1981	3 610	3 429	2 109	-	846	474
	1986	4 713	4 263	2 481	-	1 137	645
	1992	8 420	7 584	5 067	-	1 612	906
Other females	1961	887	829	566	40	138	85
	1971	1 517	1 417	953	68	244	153
	1981	3 329	3 104	2 057	146	551	350
	1986	3 932	3 638	2 146	279	694	519
	1992	7 139	6 757	4 248	228	1 369	912
Other males	1961	821	743	476	28	145	94
	1971	1 247	1 130	734	43	216	137
	1981	3 094	2 807	1 847	108	525	326
	1986	3 558	3 453	1 527	97	1 122	707
	1992	4 885	4 602	3 226	87	794	495

Note:

1. See footnotes to Table A.1.

Table C.4
Unpaid Work at Replacement Cost (Specialist) by Activity

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
All persons (15+)	1961	22 739	21 765	11 758	2 726	5 294	1 987
	1971	48 775	46 658	24 923	5 534	11 800	4 401
	1981	140 653	134 575	74 000	15 386	33 340	11 849
	1986	189 725	180 374	93 241	15 817	56 526	14 791
	1992	296 606	281 819	158 966	27 952	70 788	24 112
Employed	1961	8 341	7 939	3 721	842	2 401	975
	1971	21 206	20 239	9 610	2 120	6 102	2 408
	1981	69 603	66 637	33 466	7 447	18 612	7 113
	1986	92 608	88 060	42 385	8 044	29 588	8 043
	1992	147 438	141 319	76 005	15 654	35 991	13 669
Not employed	1961	14 398	13 825	8 036	1 884	2 893	1 012
	1971	27 570	26 419	15 314	3 414	5 698	1 993
	1981	71 050	67 937	40 534	7 939	14 728	4 736
	1986	97 116	92 315	50 856	7 773	26 938	6 748
	1992	149 168	140 499	82 961	12 298	34 797	10 443
Females (15+)	1961	14 858	14 288	8 165	2 011	3 099	1 012
	1971	31 776	30 522	17 198	4 076	6 940	2 309
	1981	90 651	87 043	49 686	11 186	19 881	6 290
	1986	124 491	118 541	66 332	11 646	32 280	8 282
	1992	188 041	179 415	102 174	20 220	43 028	13 993
Employed	1961	2 751	2 615	1 317	241	813	244
	1971	9 240	8 850	4 500	926	2 588	836
	1981	34 704	33 366	17 492	3 987	8 955	2 932
	1986	50 939	48 339	25 226	4 861	14 401	3 850
	1992	81 577	78 622	41 990	9 239	20 250	7 143
Not employed	1961	12 107	11 673	8 848	1 770	2 286	769
	1971	22 536	21 872	12 697	3 150	4 351	1 473
	1981	55 947	53 676	32 195	7 199	10 926	3 358
	1986	73 552	70 202	41 106	6 785	17 879	4 432
	1992	106 464	100 793	60 184	10 980	22 779	6 850
Males (15+)	1961	7 880	7 477	3 592	715	2 195	975
	1971	16 999	16 136	7 726	1 458	4 860	2 092
	1981	50 002	47 532	24 314	4 200	13 459	5 559
	1986	65 234	61 834	26 909	4 171	24 246	6 508
	1992	108 585	102 408	56 792	7 733	27 759	10 120
Employed	1961	5 590	5 325	2 404	601	1 588	732
	1971	11 966	11 390	5 109	1 194	3 513	1 572
	1981	34 899	33 272	15 974	3 460	9 656	4 181
	1986	41 670	39 721	17 159	3 183	15 187	4 193
	1992	65 861	62 697	34 015	6 415	15 741	6 526
Not employed	1961	2 291	2 152	1 188	114	607	244
	1971	5 033	4 747	2 616	264	1 347	520
	1981	15 103	14 260	8 340	740	3 803	1 378
	1986	23 564	22 113	9 750	988	9 059	2 315
	1992	42 704	39 706	22 777	1 318	12 018	3 593

Table C.4

Unpaid Work at Replacement Cost (Specialist) by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Wives	1961	11 462	11 124	6 424	1 808	2 174	718
	1971	23 488	22 785	12 882	3 578	4 641	1 574
	1981	64 689	62 678	36 135	9 639	12 752	4 152
	1986	88 243	85 198	48 682	9 861	21 230	5 425
	1992	129 320	124 630	72 445	17 048	26 096	9 042
Employed	1961	1 682	1 628	852	206	420	149
	1971	6 427	6 235	3 251	818	1 595	571
	1981	24 534	23 813	12 693	3 516	5 622	1 983
	1986	35 846	34 853	18 710	4 094	9 605	2 445
	1992	58 319	56 721	31 472	8 136	12 402	4 712
With children	1961	1 070	1 046	531	188	236	92
	1971	4 267	4 179	2 104	752	952	371
	1981	16 235	15 927	8 097	3 243	3 309	1 279
	1986	23 844	23 194	12 042	3 741	5 825	1 587
	1992	38 143	37 490	18 918	8 009	7 446	3 117
Not employed	1961	9 780	9 496	5 572	1 602	1 753	569
	1971	17 061	16 550	9 741	2 760	3 045	1 003
	1981	40 154	38 864	23 442	6 123	7 131	2 189
	1986	52 397	50 345	29 973	5 767	11 625	2 980
	1992	71 001	67 909	40 973	8 912	13 694	4 330
With children	1961	7 337	7 181	3 988	1 520	1 225	448
	1971	12 223	11 955	6 636	2 605	1 960	754
	1981	24 569	24 010	13 333	5 612	3 671	1 392
	1986	27 326	26 562	14 170	5 158	5 557	1 677
	1992	33 340	32 242	16 599	8 418	5 268	1 958
Husbands	1961	5 626	5 391	2 658	667	1 408	658
	1971	12 099	11 582	5 695	1 356	3 112	1 418
	1981	35 701	34 175	17 929	3 929	8 514	3 804
	1986	47 133	44 685	19 306	3 779	17 114	4 467
	1992	80 611	76 779	42 272	7 309	19 590	7 607
Employed	1961	4 330	4 135	1 929	576	1 072	558
	1971	9 042	8 623	4 005	1 136	2 310	1 172
	1981	25 860	24 695	12 204	3 294	6 138	3 059
	1986	31 225	29 803	12 625	3 060	11 136	2 982
	1992	51 692	49 778	26 682	6 182	11 760	5 154
With children	1961	3 381	3 222	1 368	547	869	438
	1971	8 777	8 443	2 700	1 069	1 792	882
	1981	18 048	17 167	7 633	3 058	4 340	2 136
	1986	20 466	19 577	7 740	3 012	8 752	2 072
	1992	34 586	33 291	18 890	6 064	7 130	3 207
Not employed	1961	1 296	1 256	729	91	336	101
	1971	3 057	2 959	1 691	220	802	246
	1981	9 841	9 480	5 725	635	2 376	745
	1986	15 908	14 862	6 681	719	5 979	1 485
	1992	28 919	27 001	15 590	1 128	7 830	2 453
With children	1961	415	407	207	48	113	40
	1971	1 076	1 052	539	125	287	102
	1981	2 479	2 424	1 305	276	624	218
	1986	3 885	3 756	1 761	562	1 104	329
	1992	6 818	6 641	3 452	880	1 696	614

Table C.4
Unpaid Work at Replacement Cost (Specialist) by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Female lone parents	1961	709	686	403	84	154	45
	1971	1 832	1 777	1 026	253	375	123
	1981	6 573	6 389	3 630	985	1 355	419
	1986	9 451	9 143	5 168	1 125	2 244	606
	1992	16 413	15 830	8 793	2 664	3 322	1 051
Male lone parents	1961	111	103	53	11	28	13
	1971	268	253	129	31	62	31
	1981	802	754	398	84	187	84
	1986	1 260	1 167	611	130	298	129
	1992	1 927	1 764	921	217	430	196
Female children (15+)	1961	1 014	905	429	52	313	112
	1971	2 426	2 177	1 006	118	778	275
	1981	6 534	5 889	2 762	282	2 141	703
	1986	8 951	7 517	3 509	253	3 007	749
	1992	12 532	11 390	4 937	290	4 698	1 465
Male children (15+)	1961	1 122	1 016	375	14	425	202
	1971	2 463	2 241	825	28	956	432
	1981	6 277	5 721	2 226	74	2 417	1 005
	1986	6 892	6 588	3 036	136	2 644	773
	1992	9 731	8 680	4 549	104	3 060	967
Females living alone	1961	492	459	281	-	137	40
	1971	1 731	1 615	969	-	506	139
	1981	7 818	7 331	4 485	-	2 252	594
	1986	11 883	11 113	6 162	-	4 049	902
	1992	19 311	17 613	10 586	-	5 669	1 358
Males living alone	1961	284	274	138	-	106	31
	1971	854	825	408	-	327	90
	1981	3 972	3 834	1 996	-	1 443	395
	1986	5 510	5 067	2 406	-	2 117	545
	1992	10 442	9 599	5 578	-	3 145	875
Other females	1961	1 181	1 113	628	67	321	97
	1971	2 300	2 168	1 204	127	640	197
	1981	5 037	4 757	2 675	280	1 380	422
	1986	5 964	5 570	2 812	407	1 751	600
	1992	10 465	9 952	5 413	219	3 242	1 077
Other males	1961	737	692	368	24	229	71
	1971	1 315	1 236	668	43	403	122
	1981	3 251	3 048	1 766	114	897	271
	1986	4 439	4 346	1 551	127	2 074	595
	1992	5 855	5 582	3 471	102	1 534	475

Notes:

1. See footnotes to Table A.1.

Table C.5
Unpaid Work at Replacement Cost (Generalist) by Activity

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
All persons (15+)	1961	13 988	13 014	8 029	1 906	1 739	1 340
	1971	29 662	27 545	16 933	3 754	3 889	2 969
	1981	90 985	84 907	52 111	10 805	12 672	9 320
	1986	132 253	122 901	74 597	11 119	23 674	13 512
	1992	234 482	219 694	139 707	21 579	34 675	23 733
Employed	1961	4 889	4 487	2 453	588	788	659
	1971	12 483	11 517	6 414	1 451	2 022	1 630
	1981	44 250	41 284	23 237	5 318	7 117	5 613
	1986	63 362	58 812	33 552	5 564	12 372	7 324
	1992	115 607	109 487	66 152	12 162	17 690	13 484
Not employed	1961	9 099	8 527	5 576	1 318	952	681
	1971	17 179	16 028	10 519	2 302	1 868	1 340
	1981	46 736	43 623	28 874	5 486	5 556	3 707
	1986	68 891	64 089	41 045	5 555	11 302	6 187
	1992	118 875	110 207	73 555	9 417	16 985	10 250
Females (15+)	1961	9 439	8 868	5 748	1 412	1 026	682
	1971	19 932	18 677	12 043	2 778	2 299	1 557
	1981	60 370	56 763	36 339	7 929	7 549	4 946
	1986	89 651	83 700	54 480	8 142	13 515	7 563
	1992	152 340	143 714	93 423	15 453	21 072	13 766
Employed	1961	1 878	1 542	937	171	269	165
	1971	5 668	5 278	3 193	656	863	567
	1981	22 954	21 815	12 925	2 949	3 427	2 314
	1986	36 206	33 605	20 879	3 205	6 019	3 502
	1992	65 850	62 896	38 786	7 104	9 963	7 042
Not employed	1961	7 761	7 326	4 811	1 241	756	517
	1971	14 263	13 399	8 850	2 122	1 436	991
	1981	37 417	35 147	23 414	4 980	4 122	2 631
	1986	53 445	50 095	33 600	4 937	7 496	4 061
	1992	88 489	80 818	54 638	8 349	11 109	6 723
Males (15+)	1961	4 549	4 146	2 281	494	714	657
	1971	9 731	8 868	4 890	976	1 591	1 412
	1981	30 615	28 144	15 772	2 876	5 123	4 374
	1986	42 602	39 202	20 117	2 976	10 159	5 949
	1992	82 142	75 980	46 284	6 125	13 603	9 968
Employed	1961	3 211	2 945	1 516	417	518	494
	1971	6 815	6 238	3 221	795	1 159	1 063
	1981	21 296	19 669	10 312	2 369	3 689	3 299
	1986	27 156	25 207	12 673	2 359	6 353	3 822
	1992	49 756	46 582	27 367	5 057	7 727	6 441
Not employed	1961	1 339	1 201	765	77	195	184
	1971	2 916	2 630	1 669	180	431	349
	1981	9 319	8 478	5 460	507	1 434	1 075
	1986	15 446	13 994	7 444	618	3 806	2 128
	1992	32 386	29 388	18 918	1 068	5 876	3 527

Table C.5

Unpaid Work at Replacement Cost (Generalist) by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Wives	1961	7 377	7 039	4 533	1 300	721	485
	1971	14 923	14 220	9 122	2 497	1 539	1 063
	1981	43 654	41 643	26 561	6 968	4 848	3 266
	1986	63 946	60 901	40 112	6 948	8 886	4 956
	1992	105 832	101 142	66 388	13 069	12 785	8 900
Employed	1961	1 063	1 009	617	149	142	102
	1971	4 031	3 839	2 330	588	534	387
	1981	16 540	15 819	9 470	2 631	2 153	1 566
	1986	25 527	24 534	15 588	2 705	4 016	2 225
	1992	47 898	46 300	29 246	6 302	6 103	4 648
With children	1961	687	663	385	136	79	62
	1971	2 709	2 622	1 508	545	318	251
	1981	11 052	10 744	6 025	2 443	1 267	1 010
	1986	17 018	16 369	10 063	2 423	2 438	1 445
	1992	31 262	30 608	17 680	8 199	3 656	3 073
Not employed	1961	6 314	6 030	3 915	1 152	580	383
	1971	10 892	10 381	6 791	1 909	1 005	676
	1981	27 114	25 824	17 091	4 337	2 695	1 701
	1986	38 419	36 367	24 523	4 243	4 871	2 731
	1992	57 935	54 842	37 141	6 767	6 682	4 252
With children	1961	4 760	4 604	2 804	1 096	403	301
	1971	7 849	7 582	4 628	1 805	641	507
	1981	16 698	16 139	9 678	3 983	1 385	1 093
	1986	20 159	19 396	11 702	3 811	2 339	1 543
	1992	27 040	25 942	15 090	6 369	2 561	1 923
Husbands	1961	3 265	3 030	1 662	466	457	444
	1971	6 959	6 442	3 553	913	1 018	958
	1981	21 842	20 316	11 386	2 701	3 236	2 992
	1986	30 750	28 282	14 287	2 744	7 172	4 079
	1992	60 561	56 729	33 850	5 791	9 600	7 489
Employed	1961	2 534	2 339	1 210	401	352	377
	1971	5 241	4 821	2 508	756	766	792
	1981	15 937	14 772	7 789	2 252	2 338	2 412
	1986	20 301	18 879	9 233	2 265	4 662	2 718
	1992	38 825	38 911	21 184	4 875	5 768	5 084
With children	1961	1 978	1 819	857	383	283	296
	1971	3 922	3 588	1 688	713	591	596
	1981	11 159	10 278	4 842	2 100	1 653	1 684
	1986	13 460	12 571	5 621	2 229	2 830	1 891
	1992	26 112	24 816	13 370	4 790	3 492	3 164
Not employed	1961	731	691	453	65	105	68
	1971	1 718	1 620	1 045	157	253	165
	1981	5 905	5 543	3 617	449	898	580
	1986	10 449	9 403	5 054	478	2 510	1 361
	1992	21 735	19 818	12 666	916	3 832	2 404
With children	1961	240	232	133	36	36	26
	1971	616	595	341	95	92	68
	1981	1 523	1 468	861	206	231	170
	1986	2 679	2 549	1 381	392	470	306
	1992	5 169	4 993	2 861	716	818	596

Table C.5
Unpaid Work at Replacement Cost (Generalist) by Activity - Continued

Demographic group ¹	Year	Unpaid work	Household work	Domestic work	Help and care	Management and shopping	Transportation and travel
millions of dollars							
Female lone parents	1961	437	414	278	55	51	30
	1971	1 132	1 077	708	161	125	83
	1981	4 288	4 103	2 596	668	510	329
	1986	6 838	6 530	4 236	794	944	557
	1992	13 204	12 622	7 961	2 007	1 619	1 035
Male lone parents	1981	68	60	36	7	9	9
	1971	166	151	88	22	20	21
	1981	526	478	280	61	71	68
	1986	915	823	488	92	125	118
	1992	1 548	1 384	814	167	210	193
Female children (15+)	1961	625	516	309	30	103	75
	1971	1 480	1 231	722	67	258	184
	1981	4 230	3 585	2 059	167	806	552
	1986	6 402	4 968	2 839	183	1 265	680
	1992	9 503	8 361	4 474	162	2 294	1 432
Male children (15+)	1961	632	526	244	8	139	135
	1971	1 378	1 156	534	16	317	289
	1981	3 806	3 251	1 501	45	914	790
	1986	4 440	4 135	2 233	84	1 113	705
	1992	7 283	6 233	3 703	88	1 494	947
Females living alone	1961	300	266	194	-	45	27
	1971	1 041	925	665	-	165	95
	1981	4 989	4 502	3 177	-	859	466
	1986	8 301	7 531	5 022	-	1 687	823
	1992	15 489	13 792	9 669	-	2 784	1 339
Males living alone	1961	160	150	95	-	35	21
	1971	471	442	274	-	106	62
	1981	2 387	2 248	1 382	-	555	311
	1986	3 755	3 311	1 928	-	882	501
	1992	8 112	7 268	4 855	-	1 545	869
Other females	1961	700	633	434	27	106	65
	1971	1 355	1 223	826	52	212	132
	1981	3 209	2 930	1 946	126	526	332
	1986	4 163	3 769	2 271	217	733	548
	1992	8 311	7 797	4 932	216	1 590	1 060
Other males	1961	425	380	244	13	74	48
	1971	756	677	441	24	129	82
	1981	2 055	1 852	1 222	69	346	215
	1986	2 742	2 649	1 181	56	866	546
	1992	4 639	4 366	3 063	79	754	470

Note:

1. See footnotes to Table A.1.

Table D.1
Sensitivity Tests on the Imputation of Time Spent on Unpaid Work, 1961 and 1971

Test ¹	Year	Unpaid work millions of hours	Deviation from base estimate	Ratio of VUW to GDP percent	Women's share
Hours of unpaid work					
Base estimate	1961	14 709	...	...	67.7
	1971	17 519	...	...	67.3
Estimate with slower change in the use of time	1961	15 082	2.5	...	68.2
	1971	17 675	0.9	...	67.5
Estimate with faster change in the use of time	1961	14 431	-1.8	...	67.4
	1971	17 405	-0.6	...	67.3
Opportunity cost before tax					
Base estimate	1961	26 010	...	63.6	57.3
	1971	55 953	...	57.5	58.2
Estimate with slower change in the use of time	1961	26 602	2.2	65.1	57.9
	1971	56 407	0.8	58.0	58.4
Estimate with faster change in the use of time	1961	25 550	-1.7	62.5	57.0
	1971	55 605	-0.6	57.2	58.2
Opportunity cost after tax					
Base estimate	1961	21 435	...	52.4	57.9
	1971	39 443	...	40.5	58.5
Estimate with slower change in the use of time	1961	21 926	2.2	53.6	58.5
	1971	39 764	0.8	40.9	58.7
Estimate with faster change in the use of time	1961	21 054	-1.7	51.5	57.6
	1971	39 198	-0.6	40.3	58.4
Replacement cost (specialist)					
Base estimate	1961	22 739	...	55.6	65.3
	1971	48 775	...	50.1	65.1
Estimate with slower change in the use of time	1961	23 334	2.6	57.1	66.0
	1971	49 238	0.9	50.6	65.4
Estimate with faster change in the use of time	1961	22 287	-1.9	54.5	65.0
	1971	48 424	-0.7	49.8	65.0
Replacement cost (generalist)					
Base estimate	1961	13 988	...	34.2	67.5
	1971	29 662	...	30.5	67.2
Estimate with slower change in the use of time	1961	14 323	2.3	35.0	68.0
	1971	29 908	0.8	30.7	67.4
Estimate with faster change in the use of time	1961	13 743	-1.7	33.6	67.2
	1971	29 487	-0.6	30.3	67.1

Note:

1. With the base estimate for 1961, the imputed time spent on unpaid work is within +/- 10% of the 1981 benchmark, by group and activity (see Section 3.3.4), in the case of 'slower change' the imputation is within +/- 5% and, in that of 'faster change', within +/- 15%.

Table D.2
Sensitivity Tests on the Imputation of Opportunity Cost

Test	Year	Value of unpaid work millions of dollars	Deviation from base estimate percent	Ratio of VUW to GDP	Women's share
Opportunity cost before tax					
Base estimate	1961	26 010	...	63.8	57.3
	1971	55 953	...	57.5	58.2
	1981	169 607	...	47.6	58.7
	1986	225 527	...	44.6	60.9
	1992	374 095	...	54.2	58.2
Estimate excluding employers' social security contributions	1961	25 661	-1.3	62.8	57.2
	1971	54 747	-2.2	56.3	57.8
	1981	165 474	-2.4	46.5	57.7
	1986	217 092	-3.7	42.9	60.2
	1992	357 111	-4.5	51.7	57.2
Estimate based on women's earnings	1961	22 017	-15.4	53.8	67.7
	1971	48 377	-13.5	49.7	67.3
	1981	149 800	-11.7	42.1	66.5
	1986	201 946	-10.5	39.9	68.0
	1992	334 283	-10.6	48.4	65.1
Estimate based on men's earnings	1961	34 370	32.1	64.1	67.7
	1971	71 587	27.9	73.6	67.3
	1981	208 813	23.1	58.7	66.5
	1986	275 663	22.2	54.5	68.0
	1992	448 362	19.9	65.0	65.1
Opportunity cost after tax					
Base estimate	1961	21 435	...	52.4	57.9
	1971	39 443	...	40.5	58.5
	1981	111 531	...	31.3	57.6
	1986	141 384	...	28.0	61.0
	1992	221 101	...	32.0	60.3
Estimate including employees' social security contributions	1961	21 784	1.6	53.3	58.0
	1971	40 649	3.1	41.8	59.1
	1981	114 975	3.1	32.3	58.6
	1986	148 261	4.9	29.3	61.8
	1992	234 774	6.2	34.0	61.5
Estimate based on women's earnings	1961	18 342	-14.4	44.9	67.7
	1971	34 259	-13.1	35.2	67.3
	1981	96 638	-13.4	27.1	66.5
	1986	126 825	-10.3	25.1	68.0
	1992	204 886	-7.3	29.7	65.1
Estimate based on men's earnings	1961	27 907	30.2	68.3	67.7
	1971	50 140	27.1	51.5	67.4
	1981	140 979	26.4	39.6	68.4
	1986	172 205	21.6	34.1	68.0
	1992	251 326	13.7	36.4	65.1
Estimate with marginal tax rate increased by 10%	1961	21 047	-1.8	51.5	58.0
	1971	38 034	-3.6	39.1	58.7
	1981	106 481	-4.5	29.9	57.7
	1986	134 501	-4.9	26.6	61.2
	1992	208 868	-5.5	30.3	61.0
Estimate with marginal tax rate decreased by 5%	1961	21 629	0.9	52.9	57.9
	1971	40 148	1.8	41.3	58.4
	1981	114 055	2.3	32.0	57.5
	1986	144 826	2.4	28.6	60.9
	1992	227 218	2.8	32.9	60.0
Estimate with the average tax rate	1961	22 694	5.9	55.5	57.6
	1971	44 623	13.1	45.9	58.6
	1981	135 728	21.7	38.1	58.2
	1986	171 936	21.6	34.0	61.0
	1992	277 717	25.6	40.2	57.7

Table D.3
Sensitivity Tests on the Imputation of Replacement Cost

Test	Year	Value of unpaid work millions of dollars	Deviation from base estimate	Ratio of VUW to GDP percent	Women's share
Replacement cost (specialist)					
Base estimate	1961	22 739	...	55.6	65.3
	1971	48 775	...	50.1	65.1
	1981	140 653	...	39.5	64.4
	1986	189 725	...	37.5	65.6
	1992	296 606	...	43.0	63.4
Estimate excluding employers' social security contributions	1961	22 464	-1.2	54.9	65.3
	1971	47 637	-2.3	49.0	65.1
	1981	135 787	-3.5	38.1	64.4
	1986	181 520	-4.3	35.9	65.6
	1992	279 967	-5.6	40.6	63.4
Estimate based on women's earnings	1961	17 791	-21.8	43.5	66.0
	1971	39 300	-19.4	40.4	65.8
	1981	120 119	-14.6	33.7	64.9
	1986	161 879	-14.7	32.0	66.3
	1992	256 068	-13.7	37.1	64.5
Estimate based on men's earnings	1961	26 625	17.1	65.1	66.5
	1971	56 194	15.2	57.8	66.2
	1981	158 972	13.0	44.7	65.2
	1986	213 751	12.7	42.3	66.1
	1992	336 251	13.4	48.7	64.0
Estimate based on women's and men's earnings ¹	1961	20 669	-9.1	50.6	56.8
	1971	44 844	-8.1	46.1	57.6
	1981	133 336	-5.2	37.5	56.5
	1986	179 823	-5.2	35.6	59.7
	1992	286 141	-3.5	41.5	57.7
Estimate based on average earnings ²	1961	23 453	3.1	57.4	64.8
	1971	50 257	3.0	51.7	64.7
	1981	145 717	3.6	40.9	64.5
	1986	193 576	2.0	38.3	65.4
	1992	302 567	2.0	43.8	63.4
Estimate based on lowest earnings ²	1961	15 358	-32.5	37.6	65.4
	1971	33 906	-30.5	34.9	65.1
	1981	103 804	-26.2	29.2	64.9
	1986	144 109	-24.0	28.5	65.7
	1992	232 404	-21.6	33.7	64.5
Estimate based on highest earnings ²	1961	29 788	31.0	72.9	65.4
	1971	63 008	29.2	64.8	65.1
	1981	178 807	27.1	50.2	64.8
	1986	233 351	23.0	46.1	66.1
	1992	386 026	30.1	55.9	63.2

Table D.3

Sensitivity Tests on the Imputation of Replacement Cost - Continued

Test	Year	Value of unpaid work millions of dollars	Deviation from base estimate	Ratio of VUW to GDP percent	Women's share
Replacement cost (generalist)					
Base estimate	1961	13 988	...	34.2	67.5
	1971	29 662	...	30.5	67.2
	1981	90 985	...	25.6	66.4
	1986	132 253	...	26.2	67.8
	1992	234 482	...	34.0	65.0
Estimate excluding employers' social security contributions	1961	13 800	-1.3	33.8	67.5
	1971	28 993	-2.3	29.8	67.2
	1981	87 910	-3.4	24.7	66.4
	1986	127 010	-4.0	25.1	67.8
	1992	222 538	-5.1	32.2	65.0
Estimate based on women's earnings	1961	12 698	-9.2	31.1	67.6
	1971	27 817	-6.2	28.6	67.3
	1981	85 685	-5.8	24.1	66.4
	1986	123 378	-6.7	24.4	67.8
	1992	221 242	-5.6	32.1	65.0
Estimate based on men's earnings	1961	24 283	73.6	59.4	67.9
	1971	51 029	72.0	52.5	67.5
	1981	141 651	55.7	39.8	66.6
	1986	214 920	62.5	42.5	68.0
	1992	340 594	45.3	49.4	65.1
Estimate based on women's and men's earnings ¹	1961	16 377	17.1	40.1	52.4
	1971	35 269	18.9	36.3	53.0
	1981	104 237	14.6	29.3	54.5
	1986	152 552	15.3	30.2	54.9
	1992	262 781	12.1	38.1	54.7

Notes:

1. The imputed replacement cost of women's unpaid work is based on women's earnings by occupation, and that of men, on men's earnings.
2. In several occupations for each type of unpaid work.

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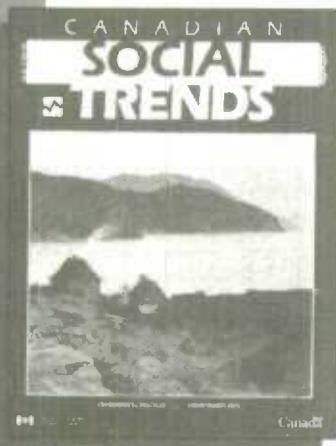
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