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**Household Production Accounts
for Canada, Mexico, and the United States:
Methodological Issues, Results, and Recommendations**

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Barbara M. Fraumeni¹

Introduction

Men and women spend a majority of their time in nonmarket activities, yet the importance of these activities goes unrecognized in the official measure of economic activity: Gross Domestic Product (GDP). Failure to do so implicitly devalues the worth of nonmarket activities, yet no society can function without them. Household production accounts are available for a number of countries; sometimes these household production accounts are constructed by government agency's staff. Household production accounts cover a subset of nonmarket activities, therefore neglecting some activities or failing to properly identify future benefits of some activities, such as those leading to human capital creation. In addition in many cases neither nonmarket nor household production accounts can be easily compared to macroeconomic measures appearing in official national income (GDP) accounts. Commonly this is because they are in nominal dollars only and fail to have measures of both inputs and outputs, but other problems also exist. The lack of measures of market and nonmarket activities on a comparable basis limit

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attempts to design public policies which impact on economic growth and social well-being.

The focus of this paper is on household production accounts for Canada, Mexico, and the United States, specifically accounts constructed by Hamdad [2003] (Canada), Harvey and Mukhopadhyay [2005] (Canada), Gómez Luna [undated] (Mexico), and Landefeld, Fraumeni, and Vojtech [2006] (United States).² Construction of these accounts depends on time use surveys. There are major conceptual and methodological issues surrounding both nonmarket or household production accounts and time use surveys. Each of the accounts and time use surveys to be discussed have made different choices about how to implement these accounts, including what activities and what populations to cover. This paper will discuss these differences, present the major results of the accounts, and propose ways to move forward to improve the accounts and increase international comparability with an eye to facilitating public policy formulation.

Household production accounts use Reid's third-party criterion to determine what activities are to be covered;³ nonmarket accounts can include all activities which occur outside of the market sector.⁴ The third-party criterion calls for the inclusion of activities in household production accounts for which you could readily pay another party to perform the activity.⁵ Nonmarket accounts include all household production account

² Two household production accounts are included for Canada as Harvey and Mukhopadhyay [2005] use a distinctly different methodology from the others.

³ Reid [1934].

⁴ Nonmarket accounts are rare. One example of a nonmarket account is that constructed by Jorgenson and Fraumeni [1987, 1992].

⁵ Some activities which could pass the criterion are still normally excluded from household production accounts; most notably child-bearing by surrogate mothers.

activities as well as excluded activities such as attending school and receiving health care. Nonmarket accounts may or may not include some activities such as leisure or sleep.

Time Use Accounts

Time use surveys are the foundation upon which almost all nonmarket or household production accounts are built.⁶ The multinational time budget study of Szalai and his collaborators [1972] is frequently cited and has been used as a model for subsequent time use surveys. Ideally through the use of sampling techniques the whole population of a country should be covered and their activities at different times of the day, days of the week, and times of the year.⁷ As subgroups of the population and people living in different areas of the country may have significantly different patterns of time use, ideally samples should be sufficient to identify these differences. However, primarily for budgetary reasons the ideal is rarely achievable.

One of the major difficulties in time use surveys is dealing with secondary activities.⁸ Assume for the moment that one can obtain accurate information on secondary activities from survey respondents. What does one then do with this information? Should a day be allowed to have more than 24 hours in it or should a 24 hour day be split somehow

⁶ The set of nonmarket accounts which underlie the research by Jorgenson and Fraumeni [1989, 1992] essentially do not rely on time use accounts for determination of how much time is spent performing different nonmarket activities as they divide nonmarket time into only 3 broad categories: Time spent in formal schooling, time spent in personal maintenance and sleep, and time spent in other activities.

⁷ Much has been written on time use surveys. A brief summary is in Statistics Jackson and Chandler [1995]. See also the chapter by Harvey and other chapters in the book edited by Pentland, et. al. [2002] and the article by Juster and Stafford [1991].

⁸ See Pollak [1999] for a more detailed discussion of secondary and passive (standby) activities and other articles on time use in the same *Monthly Labor Review*.

among primary and secondary activities? What about passive secondary activities, such as sleeping in the same house as your children to be there if needed? Frequently information only on certain secondary activities, such as child-care, are collected, and even then sometimes with occasional special supplements to the regular time use surveys.

Another issue to be mentioned briefly includes collection methodology. Some time use surveys are conducted using time diaries; others are collected using a direct approach. For a time-diary, how long are the time intervals: 5 minutes, 10 minutes, or left to the respondent? A direct approach might be implemented through telephone interviews, mailed-out surveys, or personal interviews or even a combination of these approaches possibly with follow-up. Computer-assisted systems may or may not be used. Is the information collected from one household member who may or may not report time use by other household members? How is information on children collected? What is the recall period: Yesterday (one day), last week (one or more days), or what? Might respondent fatigue be an issue if time use surveys are collected as part of another survey?⁹ Collection methodology can impact on the results of time use surveys, so time use survey collection methodology must be researched and designed carefully.

⁹ Households that have completed their last (8th) month of the Current Population Survey are eligible for inclusion in the American Time Use Survey (ATUS), the recently instituted U.S. time use survey. Respondent fatigue may be one reason why the response rate for ATUS is less than originally expected.

Valuation Methods in Household Production Accounts

Labor input is clearly the largest input to household production.¹⁰ Labor inputs to household production can be valued either with a replacement or an opportunity cost approach. The term “replacement” in the first approach refers to the fact that the value of the labor input of the unpaid household worker is being determined by how much it would cost to replace that worker with a paid household worker. A choice is typically made between using the cost of a generalist, e.g., someone who performs all of the household tasks, or specialists, e.g., a number of workers such as cooks and plumbers who are particularly skilled in performing individual tasks.¹¹ The U.S. Committee on National Statistics’ Panel to Study the Design of Nonmarket Accounts recommended an unusual variation on the replacement approach: A productivity adjusted replacement cost. Under this variation the specialist wage is adjusted by the relative productivity of the unpaid household worker compared to a specialist.¹² With an opportunity cost approach, the market wage of the individual who performs the unpaid household task is used to value that time.¹³ As will be demonstrated later, the differences in the value of household labor input using different methodologies can be significant.

¹⁰ Table 3 of Landefeld et. al. gives a sense of the relative magnitudes of inputs to household production. In 2004, housing services (think housing capital input) are \$1,221 million, consumer durables services (think consumer durable capital input) are \$865 million, and nonmarket household services (think labor input) is \$2,219 million.

¹¹ The generalist approach is frequently called the housekeeper approach as it is as if one person (a housekeeper) is hired to perform all tasks.

¹² See equation 1.2, p. 31 of Abraham and Mackie [2005].

¹³ The unpaid household worker may not perform market work. This is not a problem as the opportunity cost wage is typically taken as the average wage paid to those who do market work who are demographically similar.

Most household production accounts use an input approach to valuing output. These accounts, which frequently only value labor input rather than valuing capital input as well, set the value of output equal to the value of input in nominal dollars and are in nominal dollars only.

Another possibility is to use an output approach. The output approach values the household production account good or service being produced at the price at which a similar good or service can be bought in the market. The household production account by Harvey and Mukhopadhyay [2005] for Canada is included in this paper primarily to illustrate this technique.

Accounts by Country

Coverage

There are significant differences in the year(s) for which the household production account is constructed and in the population covered except in the case of the two Canadian accounts. Harvey and Mukhopadhyay [2005] and Hamdad [2003] use the same data set, except that Hamad compares results over two years: 1992 and 1998, and Harvey and Mukhopadhyay construct a household production account for only one year: 1992.

Gómez Luna constructs a household production account for 1996 and Landefeld,

Fraumeni and Vojtech construct a household production account for 1946-2004.

The youngest persons included in the household production account range from eight for Mexico, fifteen for Canada, and eighteen for the United States. All of the time use surveys which underlie the household production accounts interview one randomly

picked individual from each selected household, except for the Mexican time use survey. Time use is collected for every member of a selected Mexican household.

The time use surveys employed are for Canada the Statistics Canada's General Social Survey (GSS), for Mexico the Mexican National Survey of Work Contributions and Time Use (ENAUT),¹⁴ and for the United States data the Multinational Time Use Study (MTUS) for 1965, 1975, and 1985¹⁵ and the American Time Use Survey (ATUS) for 2003-4.^{16 17} In each case the samples taken are representative of the population as a whole, but not necessarily of particular subsamples.¹⁸ The size of the Mexican sample is unknown; that for Canada is about 10,000 persons and for the United States in 2004 just over 13,000 persons. The GSS and ATUS ask for information on time use for one day. ENAUT asks for information on time use for the previous week. Both GSS and ATUS use a Computer-Assisted Telephone System (CATI). GSS interviews take place within 48 hours following the designated time use day and ATUS interviews cover time use from 4 AM on the previous day to 4 AM on the contact day.

Hamdad and Gómez Luna include only labor as an input to household production. Harvey and Mukhopadhyay may implicitly be including consumer durable inputs as well. They subtract intermediate inputs and the cost of the Use Of (a portion of) Dwelling (UOD) per unit of household output from the basic price of the good or services of like

¹⁴ National Institute of Statistic, Geography and Informática, *National Survey on Work, Contributions and Use of Time* [undated].

¹⁵ Centre for Time Use Research, *Multinational Time Use Study* [undated].

¹⁶ U.S. Bureau of Labor Statistics [undated].

¹⁷ Time use estimates for earlier years come from Eisner [1989].

¹⁸ The term population is used as a general term; often the represented population is the civilian noninstitutional population.

quality, but do not subtract consumer durables services. Consumer durables include motor vehicles, stoves, refrigerators, washing machines, and so on. Landefeld et. al. include labor, consumer durables, government roads capital related to household production, and residential housing services as inputs to household production.¹⁹ Landefeld and McCulla [2000] include intermediate inputs to household production in an illustration of an extended input-output account for household production.

Valuation

With the exception of the Harvey and Mukhopadhyay household production account, which values household production through the basic price of goods or services of like quality, all other household production accounts which are being examined in this paper value labor input in at least two different ways for comparison purposes. Hamdad values labor using three approaches: opportunity cost, specialist cost, and generalist cost. The generalist cost approach is cited as the preferred approach and is the only one reported.²⁰ Gómez Luna uses two variations of a specialist approach. In the first, average specialist wages are taken from the System of National Accounts of Mexico (SNAM). In the second, average specialist wages are taken from ENTAUT. As individuals typically do not know the dollar value of contributions and benefits paid by employers, the estimates based on the ENTAUT household survey are lower as expected than those reported in SNAM, which relies on an employer survey. Hamdad values labor using three approaches: opportunity cost, specialist cost, and generalist cost. The generalist cost

¹⁹ Some consumer durables which relate to maintenance are excluded.

²⁰ Jackson and Chandler [1995] value labor using an opportunity cost approach before and after tax, a generalist approach and a specialist approach and show their results for all four approaches. However, 1992 is the last year of their Canadian household production account.

approach is cited as the preferred approach. Landefeld et. al. use all four approaches to valuing labor input outlined above: opportunity cost, specialist cost, and generalist cost, and productivity adjusted specialist cost, as well as a minimum wage variation on the generalist approach. The generalist approach using a housekeeper's wage is the basis for all but one table.

As noted earlier, Landefeld et. al. include capital, as well as labor, input to household production. Residential housing capital input is already imputed as part of the U.S. National Income and Product Accounts (NIPA's). Consumer durable capital input is imputed by multiplying consumer durable stocks by a gross rate of return. A gross rate of return is the sum of a net return to capital plus a depreciation rate. As the NIPA's estimate the return to government capital input as depreciation only, the Landefeld et. al. NIPA value for government capital input is increased by the net return, which is a net rate of return times the government road capital stock.

Because national accounts are a double-entry system, any income-side imputation, be it labor or capital input, must be added to the product-side. Accordingly in Landefeld et. al.'s household production account adjusted GDP, housing, services of consumer durables, and nonmarket services (the labor component) are added to personal consumption expenditures services and the net return part of services of government (road and other) capital is added to government consumption and investment.²¹

²¹ To be consistent, when a net return is imputed to government road capital, a net return must be imputed to all types of government capital. Expenditures on consumer durables are reallocated from consumption to investment, but this has no impact on GDP.

Harvey and Mukhopadhyay's main challenge is to estimate basic prices per unit at which a similar good or service can be bought in the market. A basic price is equal to market price less tax and plus subsidy. Intermediate inputs per unit of production is subtracted in order to treat household production in a manner similar to GDP market production. They rationalize subtracting UOD from household production by noting UOD is already included in Canada's GDP. Accordingly to be more comparable with the Landefeld et. al. household production account with both capital and labor input, the adjusted version in Table 1 below with UOD included should be used as a basis for a U.S. – Canada comparison.

Results Comparisons

Although all four featured household production accounts are in nominal dollars (not adjusted for inflation or quality change), since the years covered vary results are presented in terms of percentages of GDP as currently measured in the country's national accounts.

Three types of comparison are presented: 1) Comparisons for various years with adjustments made to increase comparability, 2) Comparisons with all included components, and 3) Comparisons by gender. The adjusted and unadjusted results are included in one table: Table 1. Results in Table 1 are listed by approach in descending order determined by the maximum estimate relative to GDP for that approach; then within approach by size of estimate relative to GDP from largest to smallest. Results

from Harvey and Mukhopadhyay [1996] which are listed in Harvey and Mukhopadhyay [2005] and use an input approach, are included as well in Table 1.

Table 1 Household Production Account Results				
Household Production as a Percent of GDP by Methodology				
Country	Author	Year	% of GDP	Adjustments/comments
Opportunity Cost				
U.S.	L	1985	78	Labor and capital input, labor input before tax
U.S.	L	2004	70	Labor and capital input, labor input before tax
U.S.	L	1985	68	Labor input only, before tax
U.S.	L	2004	62	Labor input only, before tax
Canada	H & M	1992	54	Labor input, before tax
Canada	H & M	1992	32	Labor input, after tax
Output Approach				
Canada	H & M	1992	50	Includes household maintenance, caring, volunteer work, education and UOD
Canada	H & M	1992	47	Includes household maintenance, caring, volunteer work and education; excludes UOD
Canada	H & M	1992	44	Includes household maintenance, caring and UOD; excludes volunteer work and education
Canada	H & M	1992	42	Includes household maintenance and caring; excludes volunteer work, education and UOD
Specialist Cost				
Canada	H & M	1992	43	Labor input, before tax
U.S.	L	1985	40	Labor and capital input, labor input before tax
U.S.	L	2004	32	Labor and capital input, labor input before tax
U.S.	L	1985	31	Labor input only, before tax
U.S.	L	2004	24	Labor input only, before tax
Mexico	G L	1996	23	Labor input only, wages from SNAM
Mexico	G L	1996	22	Labor input only, wages from ENTAUT

Quality Adjusted Specialist Cost				
U.S.	L	1985	36	Labor and capital input, labor input before tax
U.S.	L	2004	28	Labor and capital input, labor input before tax
U.S.	L	1985	26	Labor input only, before tax
U.S.	L	2004	20	Labor input only, before tax
Generalist Cost				
Canada	H	1992	36	Labor input only, before tax
U.S.	L	1985	35	Labor and capital input, labor input before tax
Canada	H & M	1992	34, 36	Labor input only, before tax
Canada	H	1998	33	Labor input only, before tax
U.S.	L	2004	27	Labor and capital input, labor input before tax
U.S.	L	1985	26	Labor input only, before tax
U.S.	L	2004	19	Labor input only, before tax
Generalist Cost – Minimum Wage				
U.S.	L	1985	28	Labor and capital input, labor input before tax
U.S.	L	2004	20	Labor and capital input, labor input before tax
U.S.	L	1985	18	Labor input only, before tax
U.S.	L	2004	12	Labor input only, before tax

G L = Gómez Luna [undated]

H = Hamdad [2003]

H & M = Harvey and Mukhopadhyay [1996]

L = Landefeld et. al. [2006]

The message of Table 1 is clear: Methodology matters. The opportunity cost method with labor input before tax clearly produces the highest estimates. This is obvious even without making comparisons across estimates produced by the same researchers that differ only by the input cost used, but the difference are even more obvious comparing same researcher estimates, focusing on labor input. Opportunity cost household production as a percent of GDP in Landefeld et. al. is more than double that for any other

input cost valuation method, with one exception: Opportunity cost labor and capital input household production as a percent of GDP in 1985 is not quite double that for any other input cost valuation method. Opportunity cost household production as a percent of GDP in Harvey and Mukhopadhyay is 10 to 20 percentage points higher than that for any other input cost valuation method. The output approach produces the next higher set of estimates, where the differing percent of GDP is simply a function of what is included in the Harvey and Mukhopadhyay household production account. Specialist cost household production as a percent of GDP by researchers for a specific year and coverage is typically 5 percentage points higher than generalist cost household production as a percent of GDP.²² Only Landefeld et. al. construct quality adjusted specialist cost estimates and minimum wage generalist cost estimates. Quality adjusted specialist cost estimates are always lower than the unadjusted specialist cost estimates because Landefeld et. al. assume that on average individuals are less skilled at performing household production tasks than market specialists. The Landefeld et. al. minimum wage generalist cost estimates are lower than the average housekeeper salary generalist cost estimates as housekeepers on average are paid more than the minimum wage. Results by country vary depending upon the methodology employed.²³

Results across country differ even when the same methodology is employed. It is impossible to know without further analysis if the differences arise because of essential differences in the nature of household production in different countries, the time devoted

²² Harvey and Mukhopadhyay present two generalist cost estimates.

²³ Note that in the one case when household production accounts estimates exist for the same country for the same year using the same methodology, household production as a percent of GDP is almost identical. Harvey and Mukhopadhyay's generalist cost labor input estimate for Canada for 1992 is 34%; Hamdad's estimate is 33%.

to them, the valuations applied, or because the household production accounts are constructed for different years. The scope of the activities included in Gómez Luna, Hamdad, and Landefeld et. al. (labor input only version) does not seem to explain differences, with the possible exception of secondary activities and volunteer activities, as the major activities are included in all of these household production accounts.²⁴

Consistently by country in comparable cases, household production as a percent of GDP falls across time.

Table 2 Household Production Account Results					
Share of the Value of Household Labor Input Performed by Gender					
Country	Author	Year	Women (%)	Men (%)	Version
Mexico	G L	1996	85	15	Specialist cost, labor input only, wages from SNAM
Mexico	G L	1996	82	18	Specialist cost, labor input only, wages from ENTAUT
Canada	H	1992	65	35	Generalist cost, labor input only, before tax
Canada	H	1998	63	37	Generalist cost, labor input only, before tax
U.S.	L	2003 & 2004	62	38	Generalist cost, labor and capital input, labor input before tax

G L = Gómez Luna [undated]

H = Hamdad [2003]

L = Landefeld et. al. [2006]

Table 2 looks at the share of the household production done by women versus men by value of the household production as opposed to time spent. The share of the value of household production by women in Mexico is substantially higher than it is for the other two countries. The differences would not seem to be explained by the cost approach used. If anything use of specialist cost rather than generalist cost would seem to increase the share for men relative to that for women as men on average perform nonmarket tasks

²⁴ In Hamdad, the value of volunteer activities is 6% of the value of all unpaid activities in 1998.

that if performed in the market would be more highly remunerated than the nonmarket tasks performed by women. The shares for Canada and the U.S. are quite similar particularly as the one piece of evidence: Canadian shares in 1992 and 1998, would suggest that the share of household production performed by women may be falling slightly over time.

Household Production Accounts and GDP Accounts

The basis for GDP accounts in Canada and Mexico is the System of National Accounts 1993 (SNA 1993).²⁵ In the U.S. it is the National Income and Product Accounts (NIPA's),²⁶ but the NIPA's in most cases are consistent with SNA 1993. By definition household production accounts include activities not included in GDP accounts as household production accounts cover nonmarket activities, while GDP accounts include market activities. However, looking beyond activities performed and time use, the overlap between a household production account and a GDP account is substantial. The paper by Landefeld et. al. allows one to get a sense of the overlap as it embeds the household production account into an expanded NIPA. Personal consumption expenditure (PCE), which is about two-thirds of GDP would be in both. However, a household production account would treat a substantial portion of PCE as intermediate input to household production, e.g., food used in the preparation of food cooked at home. Consumer durables are not capitalized in GDP accounts, yet arguably they should be in a household production account. Instead in the GDP accounts they are treated as consumption. Housing services are already capitalized in the GDP accounts. To

²⁵ Commission of the European Communities, et. al. [1993].

²⁶ U.S. Bureau of Economic Analysis [undated].

maximize the extent to which the magnitudes from a household production account are comparable to those in current GDP account magnitudes, both labor and capital input should be included. Landefeld et. al.'s augmented GDP with labor and capital input as a percent of GDP is 8 to 10 percentage points higher than a version with labor input only.

Recommendations

Household production accounts are an important complement to GDP accounts. Public policy considering only market activities could be short-sighted and inappropriate. For women, the use of household production accounts in public policy decision could be particularly important. Both men and women spend a substantial amount of their waking hours in nonmarket activities, but women spend on average substantially more hours in household production than men.²⁷ Essential goods and services are being provided in household production that contribute to the well-being of all individuals. It is clear that all countries should strive to construct household production accounts and to make use of them in public policy decisions.

What should these household production accounts look like? Having demonstrated that methodology matters, for purposes of international comparability all household accounts should use the same methodology. The most common valuation approach is a generalist cost labor input only approach; accordingly all household production accounts should use this approach. The scope of any household production account should include childcare;

²⁷ In the U.S. in 2004 women spent 31 hours per week in household production while men spent 19 hours per week (Landefeld et. al.). In Canada in 1992 the corresponding figures for unpaid work are 29 and 16 hours per week (Jackson and Chandler).

substantial research needs to be conducted about how to adjust accounts for secondary activities, including childcare. At this point, there is no generally agreed upon approach to secondary activities. A core approach should exclude volunteer activities, as information on time spent on these activities may be limited in many countries. Display of the results from alternative approaches and with alternative scopes should be encouraged nonetheless as these give a sense of how methodology matters and to advance “how-to-do” knowledge in the field. Particularly important is the inclusion of capital as well as labor input and output measures in these alternative presentations to facilitate direct comparisons with GDP accounts. Similarly to the extent possible household accounts should be embedded in GDP accounts to give a more complete picture of all types of economic activity. This goal suggests that household production accounts should be presented in nominal and real terms, the latter that adjusts for inflation and quality changes. Even if household accounts are not embedded in GDP accounts, it is desirable to construct nominal and real household production accounts to facilitate historical comparisons and to be able to estimate productivity in both market and nonmarket sectors. How market and household production activities are performed has changed substantially over time, in major part due to technological innovations. Substitution between market and nonmarket activities and goods and services can be impacted by productivity change, as well as changes in the value of time often due to an increase in the labor force participation of women.²⁸ Time devoted to activities for major categories of time use and major demographic groups, including at least male and female,

²⁸ Landefeld et. al. have an example of the increase in the price of restaurant meals vs. meals cooked at home. Because of the increase in the valuation of home meal preparation activities coming from the increase in generalist wages, the increase in the price of restaurant meals between 1985 and 2004 is less than the increase in the (opportunity cost) price of home cooked meals.

should be presented along with the household production account values. This information on time use would allow researchers to determine the sources of differences between countries and changes across time, e.g., to what extent do the differences and changes relate to time use or to valuation wages? Finally, researchers should attempt to construct nonmarket accounts as some activities which are critical to the future of countries are only included in these accounts because of the third party rule, notably education and self health care.

To be useful to policy makers, household production accounts need to be published on a regular basis with a reasonably short lag. This can only happen if time use surveys are conducted on a regular basis. In most cases, government agencies need to construct household production accounts and conduct time use surveys if household production accounts are to be published more frequently and with a shorter time lag as reliance on private researchers is risky. The following is a brief listing of household production accounts published by the authors of the reviewed studies or employees of their agencies since 1990 and the associated time use surveys.²⁹ The Canadian General Social Survey has collected time use data every six years since 1986. Statistics Canada published articles describing measurement and valuation of unpaid work in 1995 and 2003. The 1995 Jackson and Chandler article gives results for selected years beginning in 1961; Hamad gives results for 1992 and 1998. A 2004 household production/unpaid work account has yet to be released.³⁰ Harvey and Mukhopadhyay have not released a

²⁹ For a listing of household production or unpaid work accounts prior to 1990 by country, see Table 5.1 of Jackson and Chandler

³⁰ The author of the most recent Statistics Canada household production account, Hamdad, has indicated to me that she has been busy working on volunteer accounts instead of a 2004 household production account.

household production for Canada for a year past 1992. The fact that the ATUS is conducted on an annual basis allows for construction of a U.S. household production accounts for every year. However, the Landefeld household production accounts which cover 1946-2004 [Landefeld et. al. 2006, Landefeld and McCulla 2000] are not official satellite accounts of the Bureau of Economic Analysis; accordingly it is uncertain with what frequency they will be constructed.³¹ ³² How often the Mexican household production accounts might be constructed and the underlying time use data collected is unknown, but a time use survey exists for 2002.³³ Certainly if household production accounts are to be an important source of information for policy makers, their frequency must be increased.

Household production accounts time series also would facilitate policy formulation and analysis. Researchers would need to determine why time use and its value has changed to have a sense of what policy actions might impact on time use and to have a sense of how the substantial amount of nonmarket work might be supported, particularly as the participation of women in the labor force has changed substantially over time. The U.S. Landefeld et.al. household production account and the older Canadian household production account (Jackson and Chandler 1995) provided such time series; as new results are published for Canada care should be taken to make these consistent with earlier results or to indicate any significant differences. The U.S. efforts have been

³¹ Landefeld and his co-authors were all employees of the Bureau of Economic Analysis when either all or most of the work on these accounts were done. It is more likely that official satellite accounts will be funded than research satellite accounts, such as the Landefeld household production accounts.

³² The last year available for a Jorgenson and Fraumeni nonmarket account is 1986; although Jorgenson, Fraumeni, and Christian have begun to revive the nonmarket account project, it is uncertain when results will be available. See Fraumeni [2007] for a discussion.

³³ National Institute of Statistic, Geography and Informática, *National Survey on Work, Contributions and Use of Time* [undated].

helped by the development and improvement of the MTUS and the American Heritage Time Use Study (AHTUS) data.³⁴ Expansion of these time series efforts to other countries would be useful.

None of the recommendations listed above can be implemented without a substantial commitment of resources. As noted earlier, this almost certainly would require a government commitment to annual publication of household production accounts with a reasonably short lag. As not even one of the major industrialized countries has such a program, much would have to change before the recommendations listed above could be implemented.

There has been substantial progress around the world in accounting for nonmarket activities through household production accounts, but much still needs to be done particularly to bring these accounts to the attention of policy-makers. The profile of household production accounts needs to be raised through interaction with government officials and others first to obtain funding for construction of household production accounts and the underlying time use surveys, then (perhaps simultaneously) to bring them to the attention of policy makers so that one day both GDP accounts and household production accounts are the basis for public policy.

³⁴ For information on AHTUS, see Centre for Time Use Research, *American Heritage Time Use Study* [undated].

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