

Accounting for Nonmarket Production: A Prototype Satellite Account Using the American Time Use Survey

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1. Introduction

The American Time Use Survey (ATUS) fills a major gap in U.S. economic statistics. Labor time is one of the most important inputs into market and nonmarket production. A wide range of issues ranging from understanding consumer spending and the distribution of poverty to the rate of growth in output and productivity require a comprehensive view of production and the time devoted to these activities. The ATUS will provide the first consistent and comprehensive time series on time use for the United States.

The importance of nonmarket production has been a recurring theme in the U.S. and international national accounts literature since the inception of national accounts. Simon Kuznets (1934) and a long-line of other economists that have worked on the accounts have acknowledged the importance of including household production. However, the challenges of producing a consistent up-to-date set of accounts useful to business and public economic policy officials have led most to follow Pigou (1920), who discouraged the measurement of household production and felt that national income should include only market goods and services that could “be brought directly or indirectly into relation with the measuring-rod of money.”

Abraham and Mackie (2005), in a recent National Research Council panel study, *Beyond the Market: Designing Nonmarket Accounts for the United States* (*Beyond the Market*, hereafter), argue that given the developments in national accounting, detailed data on wages, data on nonmarket activities such as housing services, and the advent of the ATUS nonmarket household production can “with mild straining” be measured indirectly with the measuring-rod of money.

This paper utilizes the new ATUS data to update earlier “satellite account” estimates of household production and highlights how this supplemental information can improve our understanding of such issues as overall economic growth and the impact of increasing women’s labor force participation, household production’s role in investment and other spending, and the role of household production over the business cycle.

The paper also extends earlier work by exploring recommendations of *Beyond the Market*. Recommendations include the use of a quality-adjusted specialist wage for valuing nonmarket household services and the development of satellite accounts that provide quantities and prices for both inputs and outputs used in home production.

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2. Satellite Accounts

One of the impediments to the development of nonmarket accounts was that the expansion of the accounts to include what were sometimes perceived as arbitrary and uncertain imputations for nonmarket activities would overburden the existing accounts and reduce their accuracy, credibility, and usefulness for analyzing, projecting, and managing market policies and activities. Two developments have helped to reduce such concerns. The first was the decision by the System of National Accounts—the international guidelines for national accounting—to recommend the use of satellite accounts for nonmarket activities rather than the expansion of existing accounts. Such accounts would allow for experimentation with changes in scope and measurement for national accounts in the form of supplementary accounts. These accounts would be consistent with and could be used with the existing national accounts without diminishing the usefulness of the core accounts.

A second and related school of thought that developed was that these accounts should be limited to production activities, or near-market activities, that can be substituted for, or contribute to, market activity. They also should be valued using proxies for market prices. In Pigou's words, they can be valued indirectly "with the measuring-rod of money." This decision removed normative measures of welfare and other subjective measurement issues where economic accountants have no comparative advantage from active debate and facilitated work moving forward on the more tractable components of estimating household production.

All of these developments in thinking are included as recommendations by the National Research Council Panel's *Beyond the Market* report:

- Nonmarket estimates for household production should be developed in the form of satellite accounts and treated consistently with their market analogs in the national income and product accounts (NIPAs).
- Household production satellite accounts should focus on the production of goods and services, including only those household activities that could be readily accomplished using market substitutes for household members' time.
- Household production should be valued using replacement cost. For household time inputs to production this would be a replacement wage—the market wage of a specialist (plumber, cook, or accountant) adjusted for differences in skill and effort between home and market production.

3. ATUS and Time Series Continuity

Many of the uses of household production accounts require time series. With time series one can measure the effect of such developments as the shift from nonmarket to market production on economic growth, its effect on trends in consumer spending on durables, or the role of household production in buffering and reducing the volatility in total (market and nonmarket) production.

Over time, the ATUS—which is an annual survey—will produce a consistent time series, which is a significant advantage over other periodic surveys conducted in the United Kingdom and other countries. For example, periodic samples, that produce information on differences in work between employed and unemployed men and women can be used to estimate the effect of business cycles on total and household production. However, they cannot estimate what the actual effect of prolonged unemployment on household production during a cyclical downturn will be (relative to the differences recorded between employed and the mainly transitionally-unemployed individuals during a non-recession survey year).

There have been a number of time use surveys conducted in the United States including those conducted at the University of Maryland in 1965-66, 1975-76, and 1981 (Juster and Stafford 1985) and at the University of Maryland in 1985, 1992-94, and 1999 (Robinson and Godbey 1999). These surveys used differing sample designs and were of much smaller sample size than the ATUS survey. Table 1 presents results for definitionally-similar categories for household production used in the ATUS and past time use surveys. The detailed ATUS activity data were aggregated to these groupings that matched past surveys (see Appendix 1 for the mapping). Most matches were fairly straightforward, but for “Animal, plant care” and “Yard, outdoor work,” the ATUS could not be mapped to these categories without double-counting so the two categories were combined into “Animal, plant, yardwork.”

How much of the difference in the results from the various surveys is to cognitive factors, sample design, sample size, response rates (and potential reporting biases) as opposed to such economic factors such as the rising market opportunity cost of women’s time is unknown.² However, one important factor in the increase in child care time (and corresponding decrease in other categories of time) may be the result of a special ATUS probe for child care that was intended to address the apparent underreporting of child care in earlier surveys.

Without additional information on the consistency of the time series, for purposes of this paper we assume that aggregate hours for household production by population group are consistent and that the differences over time, for the most part, reflect economic and behavioral differences not differences due to cognitive, sample design, and other survey-related factors. We also make the heroic assumption that hours across major categories are roughly consistent. (Most of the estimates used for this paper are based on aggregate hours, but the specialist/replacement wage estimates—described below—use the distribution of household production hours across categories and will be affected by inconsistencies.) Table 2 compares the time use surveys weighted by population composition, the same weights used in aggregating the household accounts presented in this paper.

4. Household Production Satellite Account Estimates, 1946-2004

² Under a grant from the Glaser Foundation, the Yale Program on Nonmarket Accounts is currently researching and sponsoring several papers analyzing time use surveys and their continuity. We will attempt to incorporate the findings from these studies in future research.

The satellite estimates presented in this paper adjust the NIPA gross domestic product (GDP) to show households as producers and consumer durables as investment for production. These household production satellite accounts also incorporate a return to government capital related to household production.³

Similar adjustments have been shown in previous studies, including Landefeld and McCulla (2000).⁴ However, this study extends this work by: (a) incorporating the new ATUS data; (b) narrowing the contribution of government capital to those types most related to household production; (c) examining the effect of satellite account on volatility; and (d) using alternative methods for valuing unpaid work, including quality adjustment wages as recommended by *Beyond the Market*.

5. Adjustments to NIPA GDP Accounts

Table 3 and Table 4 compare the household production satellite accounts to the NIPA accounts and present the adjustments necessary to include household production in NIPA GDP.

Household labor and capital. To maintain the double-entry national accounts, nonmarket household labor and capital are added both to the production side and to the income side, GDP and gross domestic income (GDI), respectively. These additions fully account for household production and household labor income. By recognizing households as part of production, the adjusted accounts also reclassify capital goods purchased by households, consumer durables, as investment.

While the income side of the accounts is not shown here, the value of nonmarket household services is added to compensation of employees. The services of consumer durables are added to personal income receipts on assets.

To clarify the revised treatment of the household, the summary tables shown in Table 3 and Table 4 have slightly rearranged the order of GDP components from their presentation in the NIPAs. Investment in residential structures is moved from “gross business investment” and included in a new category “investment” under the renamed category “personal consumption expenditures and investment.” Purchases of consumer durables are also moved to the new investment category. The value of nonmarket household services and the services of consumer durables are added to services in personal consumption expenditures (PCE).

Other changes and adjustments. The other major change in the satellite accounts presented here is to include services of government capital related to household production. The only types of government capital included in this measurement are

³ Capital services are attributed to government capital stocks in education, health care, and roads.

⁴ See Eisner (1989), Jorgenson and Fraumeni (1987), Kendrick (1979), and Ruggles and Ruggles (1970) for other examples.

education, health care, and roads. Only half of the total services from government structures in “highways and streets” are included in the measures.⁵

6. Estimates and Their Impact on Growth

Table 3 and Table 4 show the impacts to the existing GDP accounts between 1946 and 2004 by including household nonmarket services, services of consumer durables, and services of the specific types of government capital. The adjustments decrease GDP growth over the entire period from a 7.1 percent annual rate to a 6.8 percent annual rate.⁶ The flatter growth shows that market production grew at a faster rate as women entered the labor force and household production grew at a slower rate. In other words, the adjustments to the NIPA accounts increased GDP by 48 percent in 1946 and 26 percent in 2004. Including household production also decreases the volatility in GDP growth. The variance for NIPA GDP annual growth is 9.6 percentage points versus 8.3 percentage points in the satellite account.

While the adjustments to include household production change many component growth rates, the relative component contributions remain the same. Personal consumption expenditures is still the largest contributor to GDP growth, followed by government, investment, and net exports.

Household nonmarket services. Household nonmarket services is the largest adjustment to create the household production accounts. It is calculated by applying private household (housekeeper) compensation to the household production hours reported by time use surveys. (Table 1 presents the time use surveys used.) Nonmarket hours are interpolated between survey years (1981, 1985, and 2003). Nonmarket hours per type of person are held at 1981 levels for 1946-1980, but aggregate household hours change over time as the composition of the population changes, the mix of employed men and women and not employed men and women. Household production hours are aggregated by population categories (employed females, not employed females, employed males, and not employed males).

Between 1946 and 2004, household nonmarket services grew at a 5.5 percent annual rate, 1.6 percentage points slower than NIPA GDP. Nonmarket services made up 42 percent of NIPA GDP in 1946 and 18 percent in 2004. This shift in sources of production reflects the increase in women’s civilian labor force participation rates from 31 percent in 1946 to 59 percent in 2004. Men’s civilian labor force participation rates over the same time period declined from 83 percent to 73 percent.⁷ The production shift also demonstrates the changing opportunity costs between market and nonmarket work. In

⁵ The 50 percent-share of government roads services is based roughly on car passenger mileage adjusted to exclude commuting to work, buses, and trucks as reported by the Census Bureau for 2000. Applying the same percentage for the entire 1946-2004 period is admittedly arbitrary.

⁶ Given the absence of output price data for household production and government capital services, no inflation-adjusted, real, estimates are used in this presentation.

⁷ Figures are from the Current Population Survey (CPS) data published by the Bureau of Labor Statistics (BLS). Note that the 1946 data is based on an earlier version of the CPS which included people 14 years and older. The current survey includes people 16 years and older.

1946, the average compensation for household workers was 56 percent of the amount received by employed workers (\$1,413 vs. \$2,545). By 2004, this rate had dropped to 31 percent (\$16,464 vs. \$53,953).

Services of consumer durables. The inclusion of the services of consumer durables raises NIPA GDP by 5 percent in 1946 and by 7 percent in 2004, reflecting the increased reliance on technology and household appliances for household production as more labor hours shifted to the workplace. The household capital-labor ratio, as measured by the chained-dollar net stock of consumer durables per person engaged in household production, increased at an annual rate of 4.1 percent between 1946 and 2004.⁸ The capital-labor ratio for private nonresidential capital increased at an annual rate of only 1.8 percent over the same time period. This substitution of capital for labor in household production also reflects the lower relative price change. Between 1946 and 2004, the price of consumer durables rose at a 1.7 percent annual rate compared to a 2.8 percent annual rate for private nonresidential capital.

Government capital. Including an additional return to government capital related to education, health care, and roads increases NIPA GDP by 1 percent in 1946 and in 2004. This steady relationship reflects the consistent government investment in these types of capital in relation to GDP growth. Government net stocks in education, health care, and roads grew at a 7.4 percent annual rate over the entire period. Education capital net stocks showed the strongest growth of 8.1 percent over the same period.

Income. Measures of income are also affected by the adjustments. Household production increased labor income by 78 percent in 1946 and by 31 percent in 2004. Using a broader measure of income, personal income grew at a 6.8 percent annual growth rate in the household production accounts compared to a 7.1 percent rate in the NIPAs.

Savings and investment. The levels of personal investment and personal saving significantly increase by including household production. However, the growth rate of private investment does not change from an annual rate of 7.4 percent. Consumer durables increased private investment by 51 percent in 1946 and 2004. Gross savings grew at an annual rate of 6.9 percent during the entire period in the household production accounts compared to 6.6 percent in the NIPAs.

7. Estimates and Their Impact Comparing Robinson (1985) to ATUS (2004)

Not surprisingly, incorporating the results from the 2004, has little impact on the composition and growth of GDP. The larger effects are from the later sub-period 1985-2004.

NIPA GDP growth between 1985 and 2004 was 5.5 percent as compared to 5.1 percent when household production is included (see Table 8—“Existing” and “Housekeeper” columns). This reflects continued increases in women’s labor force participation. During

⁸ People aged 16 years and older as reported by the CPS data is used to estimate the number of people engaged in household production.

this period, female labor force participation increased from 54 percent to 59 percent and average household production hours of women worked dropped from 33.3 to 28.2 hours.

However, as illustrated in Table 6, most of the 5.1 hour reduction in average women's hours spent in household production is not the result of a higher percentage of women being employed. Household production hours of both employed and not employed women dropped over this period. If the 2004 household production hours are applied to the 1985 employment status for women, it can be seen that the average household production hours would have only dropped 0.5 hours, from 28.6 to 28.2 hours.⁹ Other economic and behavioral effects—such as the increasing opportunity cost per hour of nonmarket work and the rapid decline in the price of labor-saving household consumer durables and appliances—account for the 4.4 hours of the reduction in average hours in household production, from 32.5 to 28.2 hours.

According to NIPA data, the differential between the average hourly compensation of all workers as compared to household workers widened from \$7.75 to \$18.02 between 1985 and 2004 (see Table 7). The price of all consumer durables, including home computers and software dropped at a 0.3 percent annual rate during this period and the price of kitchen and other household appliances dropped at a 0.8 percent rate. Interestingly, the personal consumption expenditures price index for purchased meals increased faster (3.0 percent annual rate) than that of food purchased for consumption at home (2.5 percent annual rate). However, if one looks at the weighted cost of home meal production—using data from the NIPAs and the household satellite account and the prices for labor, purchased food, consumer durables, and housing services—it can be seen that the rising opportunity cost of nonmarket time results in the price index for food cooked at home to increase approximately 3.1-3.4 percent between 1985 and 2004, which is above the 3.0 percent rate of increase in restaurant meals (see Table 7).

In contrast to changes in employed women's hours, the cost-based household production satellite account results can shed little light on the reduction in household production hours for not employed women (33.3 hours vs. 28.2 hours—Table 2).¹⁰ One explanation for the decrease in women cooking hours (7.0 to 3.9) might be increased productivity in household production (such as the increased variety and quality of packaged, pre-prepared, and frozen foods), but absent an output-based measure of household production this cannot be assessed.¹¹

There was a decline in men's labor force participation rates between 1985 and 2004, but this had little effect because average household production hours for men did not rise to offset the reduction in household production hours for employed women. Average household production hours for employed men were unchanged at 15 hours while the average of hours for men who were not employed dropped from 21 to 19 hours.

⁹ The numbers do not add due to rounding.

¹⁰ Note that in all calculation of not employed persons, the measurements include both CPS definitions of unemployed and persons not in the labor force.

¹¹ Although productivity may explain part of the decline, much of it may be a demographic phenomena—the reduction in the number of children and clutter—in the home during this period.

A final feature of the 1985-2004 results worth noting is the impact of household production on volatility. As noted above, for the entire 1946-2004 period counting household production reduces the volatility of nominal GDP as household production tends to be countercyclical. For the 1985-2004 period, however, counting household raises measured volatility. The variance for GDP is increased from 1.6 percentage points to 2.6 percentage points. This increase is the result of the increase in the sensitivity of the wages of household workers to cyclical downturns (see Figure 2). During the last downturn, the compensation of household workers dropped from a peak of \$7.83 per hour in 2000 to \$6.78 in 2002 before rebounding in 2003.

8. Alternative Estimates of Household Production Time Inputs

Table 8 presents alternative satellite account estimates based on different methods for valuing household time in 1985 and 2005. This table is organized as follows:

- Column 1 for each year and the growth rate is simply the NIPA GDP estimate.
- Column 2 is the satellite account estimate using the housekeeper wage for valuing household production time (the satellite account as presented above).
- Column 3 uses “specialist” wages for valuing each of the 11 categories of household production. For example, janitorial services wages are used for valuing cleaning time and professional and business services wages are used for household management time (see Appendix 2).
- Column 4 uses judgemental approximations of quality-adjusted replacement cost as recommended in *Beyond the Market*. This approach recognizes that while the average person’s productivity in making toast may be equivalent to a professional chef, it is probably lower than that of a roofer in replacing a roof. For those types of work, the specialist wage should be adjusted to reflect the average person’s lower productivity (see Appendix 2 for quality adjustment factors).
- Column 5 shows the opportunity cost approach, which is estimated here using the average wage for all workers. This method is not recommended by *Beyond the Market*. As they note, while there is a large consumption value in household production (which is why high-waged physicians’ work in the garden or cook for their guests), surveys consistently indicate that there is also a large positive consumption value in paid work that is not counted.
- Column 6 is for reference and simply shows what the satellite account would look like if minimum wages were used in valuing household production time inputs.

The first feature that comes out of this comparison is that in measuring trend growth in production, the method used makes little difference. The growth rate for NIPA GDP over the 1985-2004 period was 5.5 percent. The alternative household production satellite account growth rates for all scenarios are 5.1 percent, except for the specialist method, which was 5.0 percent.

In terms of levels, as might be expected, the highest level is produced by the opportunity cost measure, followed by the specialist, quality-adjusted specialist, housekeeper, and minimum wage measure. Measured as share of NIPA GDP, the opportunity cost value of

unpaid household product is 58 percent of GDP in 2004 as compared to 23 percent for the specialist, 19 percent for the quality-adjusted specialist, 18 percent for the housekeeper, and 12 percent for minimum wage.

Where the estimates do differ is in the volatility of overall GDP and the trend and volatility in unpaid household product. As illustrated in Figure 2, the opportunity cost measure based on the average wages of all workers rises much faster and with less volatility than the series based on lower-income housekeeper and minimum-wage workers.

9. Output-based Estimates

An important criterion of the double-entry national accounts, which is echoed in *Beyond the Market* recommendation, is that:

“Nonmarket accounts should measure the value and quantity of outputs independently from the value and quantity of inputs whenever feasible.”
(Recommendation 1.3)

Without such estimates, it is not possible to measure contributions and sources of real economic growth from household productions, improvements in the productivity of household production, and a number of other questions that nonmarket accounts could address. One difficulty in implementing this recommendation is the absence of data on household products, such as meals cooked, number of children cared for, loads of laundry, lawns mowed, decks built, and shopping trips taken. The other problem is the difficulty in finding an appropriate price for a near market equivalent.

The United Kingdom recently produced experimental output-based household production accounts. These innovative accounts point to the possibilities as well as the challenges in producing such accounts.

The largest single category of the U.K. household production output-based accounts is owner-occupied housing, which is measured by what is equivalent to owner-occupied housing services plus the unpaid household time spent on furnishing and maintenance. The owner-occupied estimate—both in the United States and the U.K.—is based on market-rent and the U.K. time use is similar to that estimated in this article. Both of these magnitudes are included in the satellite account estimate presented in this article, and the largest subcomponent owner occupied rent is included on the income and product side of the NIPAs and valued separately. Thus, the largest of the eight components of the U.K. experimental estimates is not new information that is likely to help in analyzing changes in the productivity of household production, especially with respect to the major uses of household time, which include cooking, cleaning, shopping, and child care.

Another large category in the U.K. estimates is transportation. The source of data on household output is miles traveled by parties of individuals as reported in their National Travel Survey. The United States has some roughly similar data, but the challenge is in

finding an appropriate near market price for these activities. The U.K estimates use the per-mile price of a taxi booked in advance adjusted for the number of passengers. It is not clear that this is close enough to be an equivalent for household travel and the use of such a price index for all household trips—rural, suburban, and urban—for the United States would produce a disproportionately large estimate for this category of time use.

The U.K. child care estimate is actually closer to a specialist-based input estimate than a market-out based estimate. The U.K estimate is based on what appears to be a largely administratively-determined “child-care hour required” estimate multiplied by a live-in nanny’s wage. A preferable measure would be an estimate of actual hours of child care from a time use survey multiplied by the hourly fee for a licensed day care center. This would not only cover the labor costs associated with the child care provider, but the capital and intermediate inputs required by the market sector in producing child care.

Other time use categories valued by the U.K. estimates are nutrition and laundry. The U.K. is fortunate in having such data as price information from the “Eating Out” section of their National Food Survey, meal composition from a private survey, and average number of wash loads per household per week. Substantial research and data collection would probably be required to develop such quantity and price data for the United States.

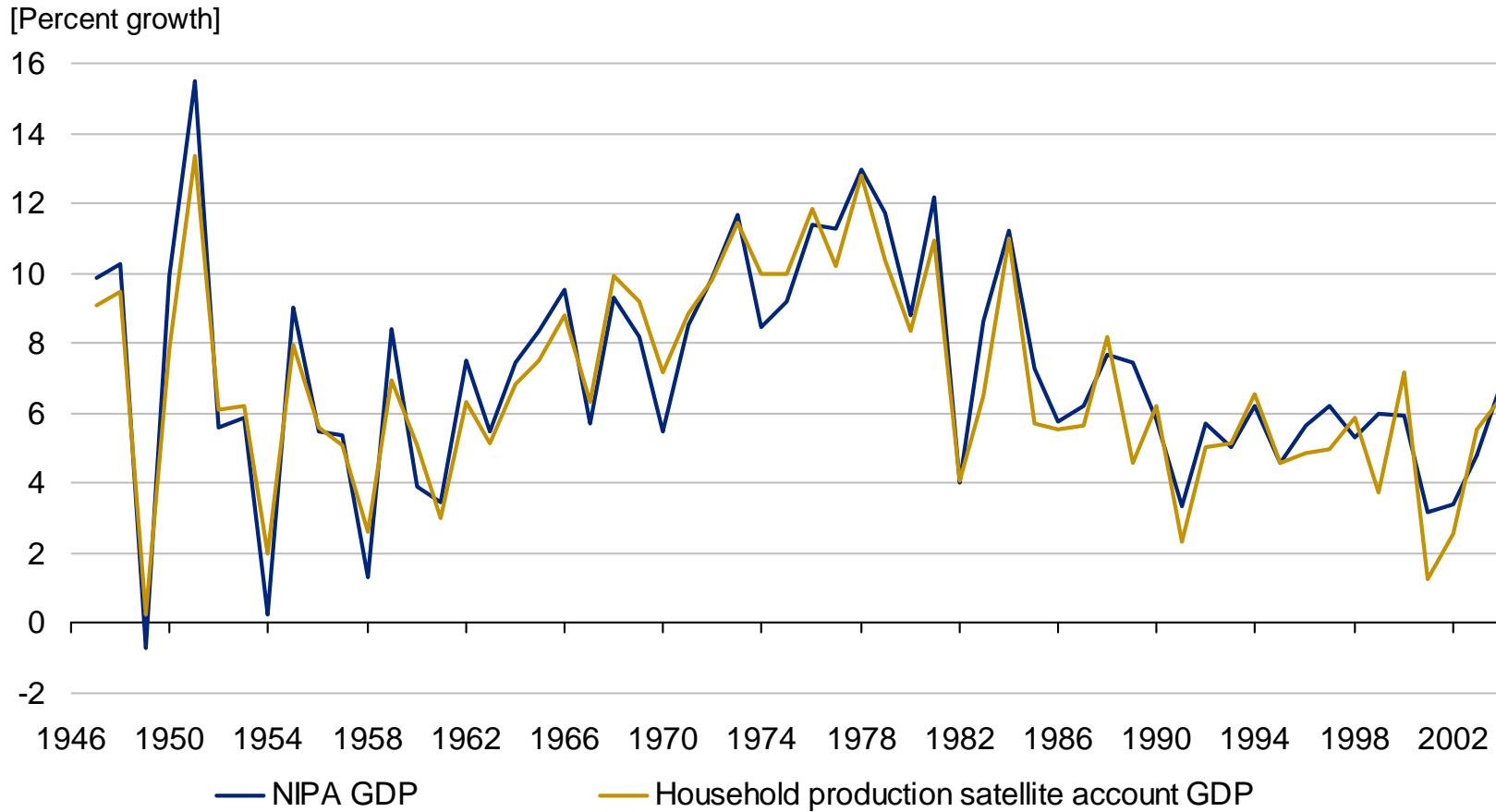
10. Conclusions

The ATUS represents the opening of a new and exciting frontier in economic measurement. With time series data and the rich micro data set associated with the ATUS, it will be possible to more accurately measure time use and its impact on a number of important economic areas, such as the analysis of consumer demand for items ranging from consumer durables to health care. Other expansions that would be possible—with parallel expansions in related source data—include satellite input-output accounts for household production, independent measurements of the inputs and outputs of household production, the cyclical impact of household production, as well as the impact on poverty and other statistics of household production.

References

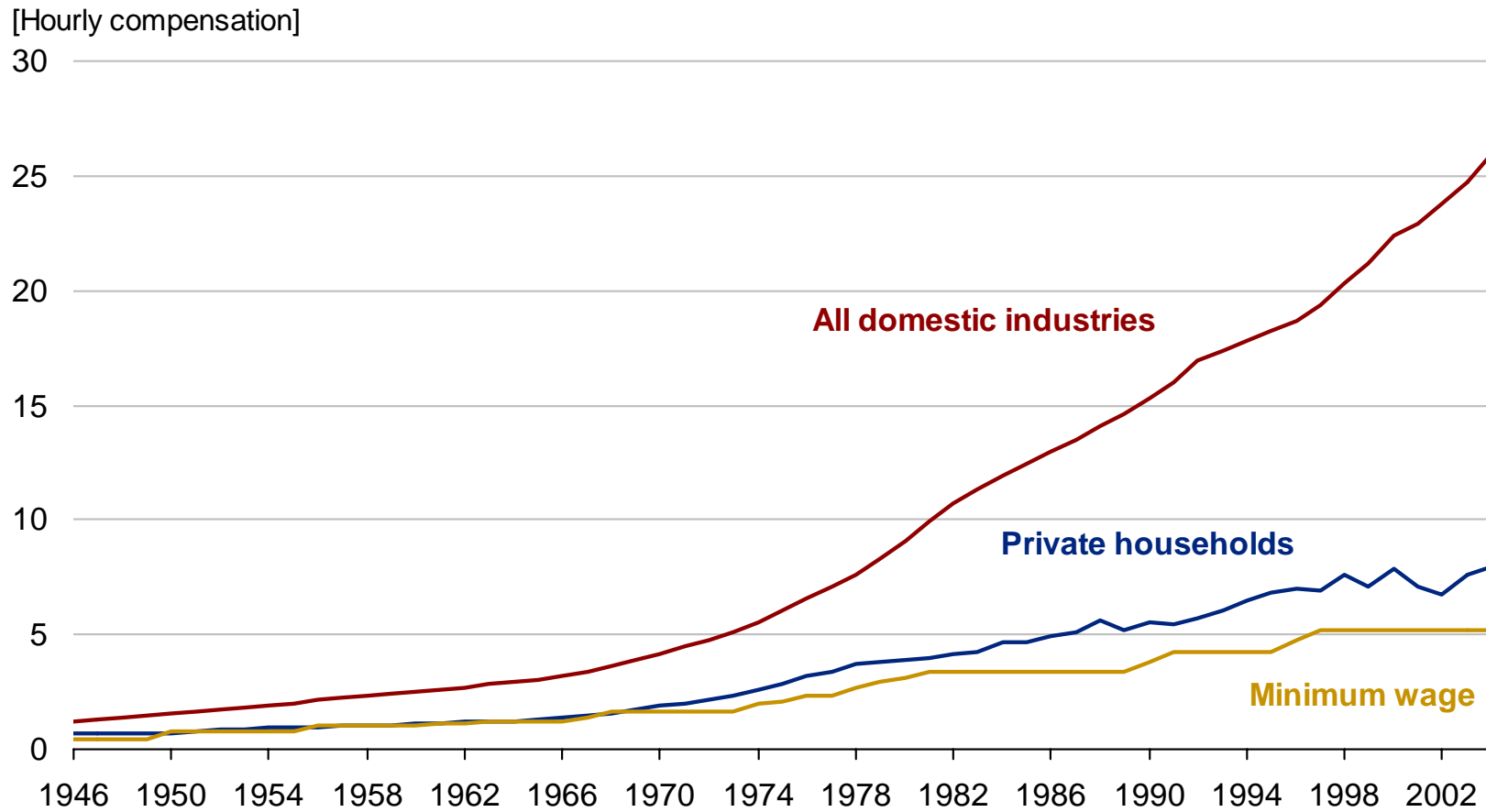
- Abraham, Katharine G. and Christopher Mackie, eds. 2005. *Beyond the Market: Designing Nonmarket Accounts for the United States*. Washington, DC: The National Academies Press.
- Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank. 1993. *System of National Accounts 1993*. Paris: Organisation for Economic Co-operation and Development.
- Eisner, Robert. 1989. *The Total Incomes System of Account*. Chicago: University of Chicago Press.
- Francis, Perry and Harminder Tiwana. 2004. "Unpaid Household Production in the United Kingdom, 1995-2000," *Economic Trends*, London: Office for National Statistics, No. 602 (January), pp. 58-66.
- Jorgenson, Dale W. and Barbara M. Fraumeni. 1987. "The Accumulation of Human and Non-Human Capital, 1948-1984," in *The Measurement of Saving, Investment, and Wealth*, R.E. Lipsey and H. Tice, eds. Chicago: University of Chicago Press, pp.227-282.
- Juster, F.T. and F. Stafford. 1985. *Time, Goods and Well-Being*, Ann Arbor, MI: Institute for Social Research.
- Kendrick, John W. 1979. "Expanding Imputed Values in the National Income and Product Accounts," *Review of Income and Wealth*, Series 25, No. 4 (December), pp. 349-363.
- Kuznets, Simon. 1934. "National Income 1929-1932." Senate Document No. 124, 73rd Congress, 2nd Session, Washington, DC: U.S. Government Printing Office.
- Landefeld, J. Steven and Stephanie H. McCulla. 2000. "Accounting for Nonmarket Household Production within a National Accounts Framework," *Review of Income and Wealth*, Series 46, No. 3 (September), pp. 289-307.
- Pigou, Arthur C. 1920. *The Economics of Welfare*. 4th ed., London: Macmillan Press.
- Robinson, John and Geoffrey Godbey. 1999. *Time for Life: The Surprising Ways American Use Their Time*, 2ⁿ ed., University Park, PA: Pennsylvania State University Press.
- Ruggles, Nancy and Richard Ruggles. 1970. *The Design of Economic Accounts*, New York: National Bureau of Economic Research.

Figure 1. NIPA GDP and Household Production GDP Annual Growth Rate, 1946-2004



Source: BEA NIPA table 1.1.5 and calculations by authors.

Figure 2. Hourly Compensation and Wage Rates for Selected Groups, 1946-2004



Source: BEA NIPA tables 6.2A-D and 6.5A-D. Minimum wage rates are from the Department of Labor.

Table 1. Time Use Survey Comparison

	Women								Men							
	Employed				Not employed				Employed				Not employed			
	Eisner 1981	Robinson 1985	ATUS 2003	ATUS 2004	Eisner 1981	Robinson 1985	ATUS 2003	ATUS 2004	Eisner 1981	Robinson 1985	ATUS 2003	ATUS 2004	Eisner 1981	Robinson 1985	ATUS 2003	ATUS 2004
Percent of total hours																
Cooking	n.a.	20	13	13	n.a.	21	16	15	n.a.	11	9	8	n.a.	12	9	10
Cleaning	n.a.	19	18	17	n.a.	22	23	22	n.a.	9	10	10	n.a.	10	12	13
Laundry	n.a.	7	8	8	n.a.	7	8	8	n.a.	2	2	3	n.a.	3	2	2
Management, paperwork	n.a.	6	5	6	n.a.	4	6	7	n.a.	9	7	6	n.a.	10	8	7
Animal, plant, yardwork *	n.a.	4	5	6	n.a.	4	6	6	n.a.	12	13	12	n.a.	15	16	16
Repairs, maintenance	n.a.	2	3	3	n.a.	1	4	5	n.a.	11	12	14	n.a.	11	16	14
Child care	n.a.	12	16	16	n.a.	17	13	14	n.a.	10	13	14	n.a.	5	4	5
Shopping	n.a.	12	13	14	n.a.	10	10	11	n.a.	11	14	14	n.a.	10	12	11
Services	n.a.	5	1	1	n.a.	4	1	1	n.a.	6	2	1	n.a.	9	2	2
Travel	n.a.	9	14	14	n.a.	7	10	9	n.a.	11	16	17	n.a.	11	13	13
Health care **	n.a.	4	2	2	n.a.	3	3	3	n.a.	6	2	2	n.a.	5	6	6
Total hours per week	28	27	25	25	43	40	33	33	13	15	15	15	23	21	20	19
Composition of labor	25	26	29	29	27	26	23	23	34	34	33	34	13	14	15	15
% of gender in employment status	48	50	56	56	52	50	44	44	72	71	69	70	28	29	31	30

* Combined two categories as published in Robinson since could not break out in ATUS data.

** For Robinson based on 10% of time spent on "Grooming, Personal, Travel, and Other" to account for time spent caring for and assisting others.

Table 2. Time Use Survey Comparison – Weighted Averages and Time Use Ranks

[Weighted average total hours]	Women							Men							
	Robinson	ATUS	ATUS		Rank [1=most]			Robinson	ATUS	ATUS		Rank [1=most]			
	1985	2003	2004		1985	2003	2004	1985	2003	2004		1985	2003	2004	
Cooking	7.0	4.2	3.9		2	2	3		2.0	1.4	1.4		2	7	7
Cleaning	7.0	5.8	5.6		1	1	1		1.6	1.9	1.8		6	5	5
Laundry	2.3	2.2	2.1		6	6	6		0.4	0.4	0.4		11	10	10
Management, paperwork	1.5	1.6	1.7		7	8	7		1.6	1.2	1.1		7	8	8
Animal, plant, yardwork *	1.3	1.6	1.6		9	7	8		2.3	2.4	2.2		1	2	3
Repairs, maintenance	0.5	1.0	1.1		11	9	9		1.9	2.2	2.3		3	3	2
Child care	5.1	4.1	4.2		3	3	2		1.4	1.6	1.7		8	6	6
Shopping	3.6	3.4	3.5		4	4	4		1.8	2.2	2.1		5	4	4
Services	1.4	0.3	0.3		8	11	11		1.1	0.3	0.2		9	11	11
Travel	2.5	3.3	3.3		5	5	5		1.9	2.5	2.5		3	1	1
Health care **	1.1	0.8	0.8		10	10	10		1.0	0.6	0.6		10	9	9
Weighted average total hours	33.3	28.3	28.2						17.1	16.7	16.5				

[Weighted average total hours]	Women & Men						
	Robinson	ATUS	ATUS		Rank [1=most]		
	1985	2003	2004		1985	2003	2004
Cooking	4.6	2.8	2.7		1	4	5
Cleaning	4.4	3.9	3.7		2	1	1
Laundry	1.4	1.3	1.3		8	9	9
Management, paperwork	1.6	1.4	1.4		7	8	8
Animal, plant, yardwork *	1.8	2.0	1.9		6	6	6
Repairs, maintenance	1.2	1.6	1.7		10	7	7
Child care	3.4	2.9	3.0		3	2	2
Shopping	2.8	2.8	2.8		4	5	4
Services	1.3	0.3	0.3		9	11	11
Travel	2.2	2.9	2.9		5	3	3
Health care **	1.0	0.7	0.7		11	10	10
Total hours per week	25.6	22.7	22.5				

* Combined two categories as published in Robinson since could not break out in ATUS data.

** For Robinson based on 10% of time spent on "Grooming, Personal, Travel, and Other" to account for time spent caring for and assisting others.

Table 3. NIPA GDP and Household Production GDP Levels and Rates of Change, 1946 and 2004

[Billions of dollars]	NIPA measures				Household production satellite account measures			
	1946	2004	Average annual rate of change (%)	Contribution to GDP growth (%)	1946	2004	Average annual rate of change (%)	Contribution to GDP growth (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gross domestic product	222.3	11,734.3	7.1	100.0	328.7	14,815.8	6.8	100.0
Personal consumption expenditures and investment	144.3	8,214.3	7.2	70.1	257.1	11,833.5	6.8	79.9
Personal consumption expenditures	144.3	8,214.3	7.2	70.1	233.5	10,171.9	6.7	68.6
Nondurables	82.7	2,368.3	6.0	19.9	82.7	2,368.3	6.0	15.8
Services	45.8	4,858.2	8.4	41.8	150.8	7,803.6	7.0	52.8
Housing	14.2	1,221.1	8.0	10.5	14.2	1,221.1	8.0	8.3
Services of consumer durables	0.0	0.0	n.a.	n.a.	11.4	866.2	7.8	5.9
Depreciation of consumer durables	0.0	0.0	n.a.	n.a.	9.6	701.8	7.7	4.8
Return to consumer durables	0.0	0.0	n.a.	n.a.	1.8	164.4	8.1	1.1
Nonmarket services	0.0	0.0	n.a.	n.a.	93.7	2,079.2	5.5	13.7
Other	31.6	3,637.1	8.5	31.3	31.6	3,637.1	8.5	24.9
Consumer durables	15.8	987.8	7.4	8.4	n.a.	n.a.	n.a.	n.a.
Investment	n.a.	n.a.	n.a.	n.a.	23.6	1,661.6	7.6	11.3
Residential	n.a.	n.a.	n.a.	n.a.	7.8	673.8	8.0	4.6
Consumer durables	n.a.	n.a.	n.a.	n.a.	15.8	987.8	7.4	6.7
Gross business investment	31.1	1,928.1	7.4	16.5	23.3	1,254.2	7.1	8.5
Nonresidential fixed investment	17.3	1,198.8	7.6	10.3	17.3	1,198.8	7.6	8.2
Change in business inventories	6.0	55.4	3.9	0.4	6.0	55.4	3.9	0.3
Residential	7.8	673.8	8.0	5.8	n.a.	n.a.	n.a.	n.a.
Net exports	7.2	-624.0	n.a.	-5.5	7.2	-624.0	n.a.	-4.4
Gov't consumption & investment with capital services	39.6	2,215.9	7.2	18.9	41.0	2,352.1	7.2	16.0
Government consumption exp. & gross investment	39.6	2,215.9	7.2	18.9	39.6	2,215.9	7.2	15.0
Services of government capital	0.0	0.0	n.a.	n.a.	1.4	136.2	8.2	0.9
Depreciation of government capital	0.0	0.0	n.a.	n.a.	0.6	41.1	7.4	0.3
Return to government capital (education, health care, & roads)	0.0	0.0	n.a.	n.a.	0.8	95.2	8.7	0.7
Other Aggregates								
Labor income	119.6	6,687.6	7.2	57.1	213.3	8,766.8	6.6	59.0
Personal income	178.6	9,713.3	7.1	82.8	283.6	12,658.7	6.8	85.4
Personal savings	15.5	151.8	4.0	1.2	31.3	1,139.6	6.4	7.7
Private investment	31.1	1,928.1	7.4	16.5	46.9	2,915.8	7.4	19.8
Gross savings	38.4	1,572.0	6.6	13.3	54.2	2,559.8	6.9	17.3

Table 4. Impacts on Components, on NIPA GDP, and on Component Shares, 1946 and 2004

	Component incr. from adjust. (%)		Impact of adjust. on NIPA GDP (%)		Component shares of NIPA GDP (%)		Satellite components share of satellite GDP (%)	
	1946	2004	1946	2004	1946	2004	1946	2004
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Gross domestic product	47.8	26.3	47.8	26.3	100.0	100.0	100.0	100.0
Personal consumption expenditures and investment	78.2	44.1	50.8	30.8	n.a.	n.a.	78.2	79.9
Personal consumption expenditures	61.8	23.8	40.1	16.7	64.9	70.0	71.1	68.7
Nondurables	0.0	0.0	0.0	0.0	37.2	20.2	25.2	16.0
Services	229.4	60.6	47.3	25.1	20.6	41.4	45.9	52.7
Housing	0.0	0.0	0.0	0.0	6.4	10.4	4.3	8.2
Services of consumer durables	n.a.	n.a.	5.1	7.4	n.a.	n.a.	3.5	5.8
Depreciation of consumer durables	0.0	0.0	4.3	6.0	n.a.	n.a.	2.9	4.7
Return to consumer durables	n.a.	n.a.	0.8	1.4	n.a.	n.a.	0.5	1.1
Nonmarket services	n.a.	n.a.	42.1	17.7	n.a.	n.a.	28.5	14.0
Other	0.0	0.0	0.0	0.0	14.2	31.0	9.6	24.5
Consumer durables	0.0	0.0	-7.1	-8.4	7.1	8.4	n.a.	n.a.
Investment	n.a.	n.a.	0.0	0.0	n.a.	n.a.	7.2	11.2
Residential	0.0	0.0	0.0	0.0	n.a.	n.a.	2.4	4.5
Consumer durables	0.0	0.0	7.1	8.4	n.a.	n.a.	4.8	6.7
Gross business investment *	-25.1	-35.0	-3.5	-5.7	14.0	16.4	7.1	8.5
Nonresidential fixed investment	0.0	0.0	0.0	0.0	7.8	10.2	5.3	8.1
Change in business inventories	0.0	0.0	0.0	0.0	2.7	0.5	1.8	0.4
Residential	0.0	0.0	-3.5	-5.7	3.5	5.7	n.a.	n.a.
Net exports	0.0	0.0	0.0	0.0	3.2	5.7	2.2	-4.2
Gov't consumption & investment with capital services	3.6	6.1	0.6	1.2	17.8	18.9	12.5	15.9
Government consumption exp. & gross investment	0.0	0.0	0.0	0.0	17.8	18.9	12.0	15.0
Services of government capital	n.a.	n.a.	0.6	1.2	n.a.	n.a.	0.4	0.9
Depreciation of government capital	0.0	0.0	0.0	0.0	n.a.	n.a.	0.2	0.3
Return to government capital (education, health care, & roads)	n.a.	n.a.	0.6	1.2	n.a.	n.a.	0.2	0.6
Other Aggregates								
Household PCE and investment share of GDP	n.a.	n.a.	n.a.	n.a.	64.9	70.0	78.2	79.9
Private investment share of GDP	n.a.	n.a.	n.a.	n.a.	14.0	16.4	14.3	19.7
Household investment share of private investment	n.a.	n.a.	n.a.	n.a.	0.0	0.0	50.3	57.0
Nonmarket services & services of consumer durables share of PCE	n.a.	n.a.	n.a.	n.a.	0.0	0.0	35.7	25.2
Labor income share of national income (GDP)	n.a.	n.a.	n.a.	n.a.	53.8	57.0	64.9	59.2
Personal saving rate (% of personal income)	n.a.	n.a.	n.a.	n.a.	8.7	1.6	11.0	9.0
Personal saving as % of GDP	n.a.	n.a.	n.a.	n.a.	7.0	1.3	9.5	7.7
National saving rate (gross savings % of GDP)	n.a.	n.a.	n.a.	n.a.	17.3	13.4	16.5	17.3

* The apparent negative impacts of the adjustments on business investment are solely a result of the reclassification of residential from business to household investment.

Table 5. NIPA GDP and Household Production GDP Levels and Rates of Change, Selected Periods

	NIPA measures							Household production satellite account measures						
	[Billions of dollars]				Growth [percent]			[Billions of dollars]				Growth [percent]		
	1946	1975	1995	2004	1946-1975	1975-1995	1995-2004	1946	1975	1995	2004	1946-1975	1975-1995	1995-2004
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
Gross domestic product	222	1,638	7,398	11,734	7.1	7.8	5.3	329	2,421	9,792	14,816	7.1	7.2	4.7
Personal consumption expenditures & investment	144	1,034	4,976	8,214	7.0	8.2	5.7	257	1,839	7,566	11,833	7.0	7.3	5.1
Personal consumption expenditures	144	1,034	4,976	8,214	7.0	8.2	5.7	234	1,643	6,652	10,172	7.0	7.2	4.8
Nondurables	83	421	1,485	2,368	5.8	6.5	5.3	83	421	1,485	2,368	5.8	6.5	5.3
Services	46	480	2,879	4,858	8.4	9.4	6.0	151	1,222	5,167	7,804	7.5	7.5	4.7
Housing	14	148	764	1,221	8.4	8.6	5.3	14	148	764	1,221	8.4	8.6	5.3
Services of consumer durables	0	0	0	0	n.a.	n.a.	n.a.	11	139	599	866	9.0	7.6	4.2
Depreciation of consumer durables	0	0	0	0	n.a.	n.a.	n.a.	10	105	464	702	8.6	7.7	4.7
Return to consumer durables	0	0	0	0	n.a.	n.a.	n.a.	2	34	134	164	10.7	7.1	2.3
Nonmarket services	0	0	0	0	n.a.	n.a.	n.a.	94	603	1,689	2,079	6.6	5.3	2.3
Other	32	333	2,115	3,637	8.5	9.7	6.2	32	333	2,115	3,637	8.5	9.7	6.2
Consumer durables	16	134	612	988	7.6	7.9	5.5	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Investment	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	24	196	914	1,662	7.6	8.0	6.9
Residential	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	8	63	303	674	7.5	8.2	9.3
Consumer durables	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	16	134	612	988	7.6	7.9	5.5
Gross business investment	31	230	1,144	1,928	7.1	8.3	6.0	23	167	841	1,254	7.0	8.4	4.5
Nonresidential fixed investment	17	174	810	1,199	8.3	8.0	4.5	17	174	810	1,199	8.3	8.0	4.5
Change in business inventories	6	-6	31	55	n.a.	n.a.	6.6	6	-6	31	55	n.a.	n.a.	n.a.
Residential	8	63	303	674	7.5	8.2	9.3	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Net exports	7	16	-91	-624	2.8	n.a.	23.8	7	16	-91	-624	2.8	n.a.	23.8
Gov't consumption & investment with capital services	40	358	1,369	2,216	7.9	6.9	5.5	41	398	1,476	2,352	8.2	6.8	5.3
Government consumption exp. & gross investment	40	358	1,369	2,216	7.9	6.9	5.5	40	358	1,369	2,216	7.9	6.9	5.5
Services of government capital	0	0	0	0	n.a.	n.a.	n.a.	1	40	107	136	12.3	5.0	2.7
Depreciation of government capital	0	0	0	0	n.a.	n.a.	n.a.	1	8	24	41	9.0	5.7	6.4
Return to government capital (education, health care, & roads)	0	0	0	0	n.a.	n.a.	n.a.	1	33	83	95	13.8	4.8	1.5
Other Aggregates														
Labor income	120	949	4,177	6,688	7.4	7.7	5.4	213	1,552	5,866	8,767	7.1	6.9	4.6
Personal income	179	1,335	6,152	9,713	7.2	7.9	5.2	284	2,077	8,440	12,659	7.1	7.3	4.6
Personal savings	16	126	251	152	7.5	3.5	-5.4	31	259	863	1,140	7.6	6.2	3.1
Private investment	31	230	1,144	1,928	7.1	8.3	6.0	47	364	1,756	2,916	7.3	8.2	5.8
Gross savings	38	297	1,185	1,572	7.3	7.2	3.2	54	431	1,796	2,560	7.4	7.4	4.0

Table 6. Female Household Production, 1985-2004

	1985	2004	Change
Percent of women			
Employed	50.5	56.0	5.5
Not employed	49.5	44.0	-5.5
Nonmarket labor hours per week			
	Robinson	ATUS	
Employed women	26.7	24.6	-2.1
Not employed women	40.1	32.7	-7.3
Weighted average nonmarket labor hours per week			
Employed women	13.5	13.8	0.3
Not employed women	<u>19.8</u>	<u>14.4</u>	<u>-5.4</u>
Total	33.3	28.2	-5.1
<i>Using 2004 employment status weights</i>			
Employed women	14.9	13.8	-1.2
Not employed women	<u>17.6</u>	<u>14.4</u>	<u>-3.2</u>
Total	32.5	28.2	-4.4
			<i>Percent of total change</i>
			86
<i>Using 2004 (ATUS) nonmarket labor hours</i>			
Employed women	12.4	13.8	1.4
Not employed women	<u>16.2</u>	<u>14.4</u>	<u>-1.8</u>
Total	28.6	28.2	-0.5
			<i>Percent of total change</i>
			9

Note: Numbers may not be additive due to rounding.

Table 7. Cooking Example – Restaurant vs. Home, 1985-2004

[Dollars in billions]	1985	2004	Growth	Share of expenses		Price used
				1985	2004	
Food price indexes						
Food purchased for off-premise consumption	69.0	109.5	2.5			
Purchased meals and beverages	63.9	111.5	3.0			
Labor						
Cooking hours per week	4.6	2.7	-2.7			
All household production hours per week	25.6	22.5	-0.7			
Cooking share of household production	17.9	12.1				
Cooking share of all hours in a week	2.7	1.6				
Average hourly compensation						
All workers	12.44	25.94	3.9			
Private households (housekeeper)	4.69	7.92	2.8			
Difference	7.75	18.02	4.5			
Capital						
Consumer durables services	359.4	866.2	4.7			
Net stock of consumer durables	1,284.9	3,578.0	5.5			
Return on consumer durables (services / net stock)	28.0	24.2	-0.8			
Housing services	412.7	1,221.1	5.9			
Net stock of residential capital	4,601.3	14,473.3	6.2			
Return on housing (services / net stock)	9.0	8.4	-0.3			
Expenses						
Food:						
Food purchased for off-premise consumption	310.5	688.4	4.3	21	36	Off-premise consumption growth
Labor:						
Annual cooking hours * private households compensation	1,115.3	1,121.6	0.0	74	58	All worker compensation growth
Capital:						
Cooking share of production hours * consumer durables services	64.2	104.9	2.6	4	5	Return on consumer durables growth
Cooking share of all hours * housing services	11.2	19.8	3.0	1	1	Return on housing growth
Total	1,501.3	1,934.8	1.3	100	100	
				3.4	3.1	Weighted average ¹

1. Share of total expenses multiplied by the price index indicated under "Price used."

Table 8. Household Production GDP Using Various Compensation for Nonmarket Labor, 1985-2004

[Billions of dollars]	Valuation approach :	1985						2004					
		Existing	House-keeper	Specialist	Quality-adj. specialist	Opportunity	Minimum wage	Existing	House-keeper	Specialist	Quality-adj. specialist	Opportunity	Minimum wage
Adjusted gross domestic product		4,220	5,802	6,095	5,872	7,655	5,481	11,734	14,816	15,454	14,994	19,550	14,089
Personal consumption expenditures and investment		2,909	4,390	4,683	4,460	6,243	4,069	8,888	11,833	12,472	12,012	16,568	11,107
Personal consumption expenditures		2,357	3,839	4,131	3,909	5,692	3,517	7,227	10,172	10,810	10,350	14,906	9,445
Nondurables		929	929	929	929	929	929	2,368	2,368	2,368	2,368	2,368	2,368
Services		1,428	2,910	3,203	2,980	4,763	2,589	4,858	7,804	8,442	7,982	12,538	7,077
Housing		413	413	413	413	413	413	1,221	1,221	1,221	1,221	1,221	1,221
Services of consumer durables		0	359	359	359	359	359	0	866	866	866	866	866
Nonmarket services		0	1,122	1,415	1,192	2,976	801	0	2,079	2,718	2,258	6,814	1,353
Other		1,015	1,015	1,015	1,015	1,015	1,015	3,637	3,637	3,637	3,637	3,637	3,637
Investment		552	552	552	552	552	552	1,662	1,662	1,662	1,662	1,662	1,662
Residential		188	188	188	188	188	188	674	674	674	674	674	674
Consumer durables		364	364	364	364	364	364	988	988	988	988	988	988
Gross business investment		548	548	548	548	548	548	1,254	1,254	1,254	1,254	1,254	1,254
Nonresidential fixed investment		526	526	526	526	526	526	1,199	1,199	1,199	1,199	1,199	1,199
Change in business inventories		22	22	22	22	22	22	55	55	55	55	55	55
Net exports		-115	-115	-115	-115	-115	-115	-624	-624	-624	-624	-624	-624
Adjusted government consumption and investment		879	979	979	979	979	979	2,216	2,352	2,352	2,352	2,352	2,352
Government consumption expenditures and gross investment		879	879	879	879	879	879	2,216	2,216	2,216	2,216	2,216	2,216
Plus: Services of government capital		0	100	100	100	100	100	0	136	136	136	136	136
Addenda:													
Share of NIPA ("Existing") GDP:													
Nonmarket services		0	27	34	28	71	19	0	18	23	19	58	12
PCE and household investment		69	104	111	106	148	96	76	101	106	102	141	95
Government capital services		0	2	2	2	2	2	0	1	1	1	1	1
Share of respective household production GDP:													
Nonmarket services		0	19	23	20	39	15	0	14	18	15	35	10
PCE and household investment		69	76	77	76	82	74	76	80	81	80	85	79
Government capital services		0	2	2	2	1	2	0	1	1	1	1	1

[Billions of dollars]	Valuation approach :	Growth, 1985-2004					
		Existing	House-keeper	Specialist	Quality-adj. specialist	Opportunity	Minimum wage
Adjusted gross domestic product		5.5	5.1	5.0	5.1	5.1	5.1
Personal consumption expenditures and investment		6.1	5.4	5.3	5.4	5.3	5.4
Personal consumption expenditures		6.1	5.3	5.2	5.3	5.2	5.3
Nondurables		5.1	5.1	5.1	5.1	5.1	5.1
Services		6.7	5.3	5.2	5.3	5.2	5.4
Housing		5.9	5.9	5.9	5.9	5.9	5.9
Services of consumer durables		n.a.	4.7	4.7	4.7	4.7	4.7
Nonmarket services		n.a.	3.3	3.5	3.4	4.5	2.8
Other		6.9	6.9	6.9	6.9	6.9	6.9
Investment		6.0	6.0	6.0	6.0	6.0	6.0
Residential		6.9	6.9	6.9	6.9	6.9	6.9
Consumer durables		5.4	5.4	5.4	5.4	5.4	5.4
Gross business investment		4.5	4.5	4.5	4.5	4.5	4.5
Nonresidential fixed investment		4.4	4.4	4.4	4.4	4.4	4.4
Change in business inventories		5.0	5.0	5.0	5.0	5.0	5.0
Net exports		9.3	9.3	9.3	9.3	9.3	9.3
Adjusted government consumption and investment		5.0	4.7	4.7	4.7	4.7	4.7
Government consumption expenditures and gross investment		5.0	5.0	5.0	5.0	5.0	5.0
Plus: Services of government capital		n.a.	1.6	1.6	1.6	1.6	1.6

Note: "Existing" (or NIPA) GDP accounts are reorganized to compare to the household production account scenarios shown in the table.

Appendix 1. Mapping of ATUS Categories to Robinson (1985) Categories

Robinson	ATUS tier code	ATUS category
Cooking	02-02-01	Household Activities: Food and drink preparation
	02-02-02	Household Activities: Food presentation
Cleaning	02-01-01	Household Activities: Interior cleaning
	02-01-04	Household Activities: Storing interior household items, including food
	02-02-03	Household Activities: Kitchen and food clean-up
	02-04-01	Household Activities: Exterior cleaning
Laundry	02-01-02	Household Activities: Laundry
Management, paperwork	02-09-01	Household Activities: Financial management
	02-09-02	Household Activities: Household and personal organization and planning
	02-09-03	Household Activities: Household and personal mail and messages (except e-mail)
	02-09-04	Household Activities: Household and personal e-mail and messages
	02-09-05	Household Activities: Home security
	02-09-99	Household Activities: Household management, n.e.c.*
Animal, plant care / yard, outdoor work *	02-05	Household Activities: Lawn, Garden, and Houseplants
	02-06	Household Activities: Animals and Pets
Repairs, maintenance	02-01-03	Household Activities: Sewing, repairing, and maintaining textiles
	02-03-01	Household Activities: Interior arrangement, decoration, and repairs
	02-03-02	Household Activities: Building and repairing furniture
	02-03-03	Household Activities: Heating and cooling
	02-03-99	Household Activities: Interior maintenance, repair, and decoration, n.e.c.*
	02-04-02	Household Activities: Exterior repair, improvements, and decoration
	02-07-01	Household Activities: Vehicle repair and maintenance (by self)
	02-08-01	Household Activities: Appliance and tool set-up, repair, and maintenance (by self)
Child care	03-01	Caring For and Helping Household Members: Caring For and Helping Household Children
	03-02	Caring For and Helping Household Members: Activities Related to household Children's Education
	03-03	Caring For and Helping Household Members: Activities Related to household Children's Health
Shopping	07-01	Consumer Purchases: Shopping (Store, Telephone, Internet)
	16-04	Telephone Calls: Telephone calls to/from salespeople
Services	08-01	Professional and Personal Care Services: Childcare Services
	16-03	Telephone Calls: Telephone calls to/from education services providers
	16-07	Telephone Calls: Telephone calls to/from paid child or adult care providers
	08-02	Professional and Personal Care Services: Financial Services and Banking
	08-03	Professional and Personal Care Services: Legal Services
	08-06	Professional and Personal Care Services: Real Estate
	08-07	Professional and Personal Care Services: Veterinary Services (excluding grooming)
	08-08	Professional and Personal Care Services: Security Procedures Related to Professional/Personal Services
	16-05	Telephone Calls: Telephone calls to/from professional or personal care services providers
	09-01	Household Services: Household Services (not done by self)
	09-02	Household Services: Home Maintenance, Repair, Decoration, and Construction (not done by self)
	09-03	Household Services: Pet Services (not done by self, not vet)
	09-04	Household Services: Lawn and Garden Services (not done by self)
	09-05	Household Services: Vehicle Maintenance and Repair Services (not done by self)
	09-99	Household Services: Household Services, n.e.c.*
	16-06	Telephone Calls: Telephone calls to/from household services providers
	10-01	Government Services and Civic Obligations: Using Government Services
10-03-01	Government Services and Civic Obligations: Waiting associated with using police/fire services	
10-03-02	Government Services and Civic Obligations: Waiting associated with obtaining licenses	
10-04	Government Services and Civic Obligations: Security Procedures Related to Government Services/Civic Obligations	
16-08	Telephone Calls: Telephone calls to/from government officials	
Travel	17-02	Traveling: Travel Related to Household Activities
	17-03	Traveling: Travel Related to Caring For and Helping household Members
	17-07	Traveling: Travel Related to Consumer Purchases
	17-08	Traveling: Travel Related to Using Professional and Personal Care Services
	17-09	Traveling: Travel Related to Using Household Services
Health care **	08-04	Professional and Personal Care Services: Medical and Care Services
	03-04	Caring For and Helping Household Members: Caring For Household Adults
	03-05	Caring For and Helping Household Members: Helping Household Adults
	03-99	Caring For and Helping Household Members: Caring for and helping household members, n.e.c..

* Combined two categories as published in Robinson since could not break out in ATUS data.

** For Robinson based on 10% of time spent on "Grooming, Personal, Travel, and Other" to account for time spent caring for and assisting others.

Appendix 2. Specialist Wage Rates and Quality Adjustments

Time use category	BLS Industry (CES)	Hourly wage 2004	Quality adjustment assumed
Cooking	Food services and drinking places	7.84	75%
Cleaning	Janitorial services	9.51	80%
Laundry	Dry-cleaning and laundry services	8.99	80%
Management, paperwork	Professional and business services	17.46	75%
Animal, plant, yardwork	Landscaping services	12.04	75%
Repairs, maintenance	Household goods repair and maintenance	14.86	50%
Child care	Child day care services	9.76	100%
Shopping	Leisure and hospitality	8.91	100%
Services	Leisure and hospitality	8.91	100%
Travel	Leisure and hospitality	8.91	100%
Health care	Individual and family services	12.14	100%