

Accounting for Household Production in the National Accounts: An Update, 1965–2014

By Benjamin Bridgman

ECONOMISTS HAVE recognized the importance of nonmarket production since at least the seminal work of Simon Kuznets (1934). One area of particular concern has been household production. The Bureau of Economic Analysis (BEA) has periodically published “satellite accounts” that estimate the value of production by households (Landefeld and McCulla 2000, Landefeld, Fraumeni, and Vojtech 2009, and Bridgman and others, 2012).¹ This article updates these estimates, providing estimates of gross domestic product (GDP) that incorporate two different types of home production activities: the production of non-market services and the return to consumer durable goods.

This article extends the previous analysis in two ways. It revisits the impact of household production over recent business cycles. Since 2003, U.S. time use data have been collected on an annual basis, so there are now annual data that cover the most recent recession and several years of the recovery. While a previous article also examined the recession, the data ended soon after the trough of the recession. The extension gives us data on several years of the recovery. I find that including the household sector has little impact on the decline during the recession, though including this sector slows the recovery.

This article also examines the impact of the decline in labor force participation that has been a significant aspect of movements of the unemployment rate. Fewer people in market work opens up the possibility of increased home production. However, I find that declining labor force participation does not have a major impact on household production. The sharpest decline has been among men, and nonemployed men do not perform many more hours of household work than employed men. Ultimately, little more is produced at home.

The rest of this article offers a look at the following:

- The methodology used to estimate household production
- The effect of household production on long-term

economic trends

- Household production in the most recent recession and recovery
- The impact of changing labor force participation rates

Methodology

Various methods can be used to calculate the value of household production. I use the same methods that were described in greater detail in Bridgman and others (2012).

Household production hours

The source of household production hours data are the Multinational Time Use Survey (MTUS) and the American Time Use Survey (ATUS). The ATUS series begins in 2003, and tracks the number of hours per day that American households spend on tasks such as cooking, housework, or gardening. The ATUS surveys are large scale, having response sizes of 15,000 to 20,000 diary days, and are conducted on a yearly basis. Prior to 2003, there were a number of smaller scale surveys of household activities undertaken by the University of Michigan and the University of Maryland. These surveys were taken more sporadically than the ATUS survey and cover 1965–66, 1975–76, 1985, 1992–93 and 1998–99. These surveys were later combined into the MTUS data set, which includes data on American households, as well as households in 14 other countries.

I combined the ATUS and MTUS data sets into a single data set that tracks household production between 1965 and 2014, following the previous methodology. The MTUS surveys split household time use into 41 different categories. There are seven categories of household production: housework, cooking, odd jobs, gardening, shopping, child care, and domestic travel. The MTUS data do not include hours for these seven categories outside the survey years. To obtain annual estimates, I interpolated hours between survey years for each category using adult population by gender and work status. The ATUS survey contains a much more detailed accounting of household activities. To retain comparability between the two data sets, I reclassified each ATUS category into one of the seven aforementioned MTUS categories.

1. Satellite accounts are frameworks designed to expand the analytical capacity of the national accounts that suits a particular analytical focus. Because they supplement, rather than replace, the existing accounts, they can be a laboratory for conceptual development and methodological refinement.

Nonmarket household services

Creating the household production account required a significant adjustment to nonmarket household services. Nonmarket household services measure the value of time spent on home production tasks. To compute household services, I first aggregated household production hours across the seven categories. The value of household services is the product of wage rate of general-purpose domestic workers and the number of hours of work. This method assumes a market cost approach of valuing nonmarket household services.

There is empirical evidence supporting this approach. Bridgman, Duernecker, and Herrendorf (2015) find a low degree of wage dispersion in the U.S. household sector compared with the rest of the economy. If the accumulation of occupation-specific human capital were important in this sector, the most experienced workers should be paid much more than inexperienced workers. They do not find evidence of this effect. The highest paid workers do not make much more than the lowest paid household workers. This finding suggests that a specialized household worker is not much more productive in performing household work than a nonspecialized private individual.

An alternative method, called the specialist cost method, uses the wages of a variety of market equivalent specialists of the categories used in valuing home production (for example, cooks, child care workers, and cleaners). For example, each hour of cooking is valued at the average cook's wage. Bridgman, Duernecker and Herrendorf (2015) apply this method to the U.S. data for 1994 to 2010 and find almost no difference from the generalist wage approach. Most household hours are spent on tasks for which the market wage of a specialist is close to the generalist wage.

Services of consumer durables

BEA's current GDP measure treats consumer purchases of durable goods as consumption. This satellite account treats such purchases as investment and adds the services of consumer durables to personal consumption expenditures. These services are measured by applying the return on personal interest income and personal dividend income, minus depreciation of consumer durables, to personal consumption expenditures on consumer durables. I use personal interest and dividend income as the return to consumer durables because, at the margin, one would expect consumers to invest in durables until the rate of return on durables was equal to the return on financial instruments that would be the alternative investment.

There is a methodological difference with Bridgman and others (2012). The previous estimates included a

term for the returns to government capital used for household production. The original satellite accounts (Landefeld and McCulla 2000) included all government capital for a broad concept of nonmarket output. Subsequent estimates trimmed this coverage to the portion that was used directly by households to narrow the focus to their production. The source data for allocating this capital to different uses is thin. In addition, keeping this term for the household sector but not for other sectors introduces an inconsistency. Returns to government capital would be included if that capital was used by a household but would not if it was used by a private firm. Given the difficulties with this component and the fact that it was very small, I exclude it from these accounts.

Long-Term Trends

Tables 1 and 2 break out the adjustments into categories for the years 1965 and 2014. In table 1, under national income and product account (NIPA) measures, the categories under services of consumer durables and nonmarket services are zero because they are not included in NIPA GDP. The estimates of these categories, which are part of our satellite account, are shown under the heading household production satellite account measures. These lead to an increase in personal consumption expenditures.

Personal investment is a new category that is created from investment in consumer durables in personal consumption expenditures and residential investment, which is categorized under gross business investment in the NIPAs. Reclassifying these as investment raises GDP because of the inclusion of a return on consumer investment. These figures are not adjusted for inflation since there is no clear price index to deflate household production.

Including the household sector slows the growth rate of output. During 1965 to 2014, the average annual growth rate of nominal GDP was 6.6 percent. When household production is included, this growth rate drops to 6.4 percent.

Household production has declined in importance over time as more women engage in market work. This sector accounted for 37 percent of the satellite account's output in 1965, but that declined to 23 percent in 2014 (table 2, page 4).

Household Production in Recession and Recovery

An important question for economists is how much of a cushion the household sector provides during recessions. As people leave market work, economic losses may be reduced by additional nonmarket work at

home. Because time use data are available on a yearly basis between 2003 and 2014, there are high-quality time use data that cover the 2007–2009 recession and several years of recovery.

Including the household sector does not have a major impact on the volatility of growth (chart 1). It has very little impact in softening the decline in the most recent recession, and it slows the recovery. The short-term fluctuations of the business cycle are overwhelmed by the general decline in the importance of household production.

As noted above, these figures are not adjusted for inflation as would be typically done in business cycle analysis. However, inflation has been low recently, so the impact of prices on the 2007–2009 recession and its recovery should be limited.

Part of the reason for the dampening of the recovery is that the growth in the services of consumer durables has been particularly weak. Examining hours exclusively will understate cyclical. Durable goods

Chart 1. GDP Growth Rates: NIPA and Satellite Account

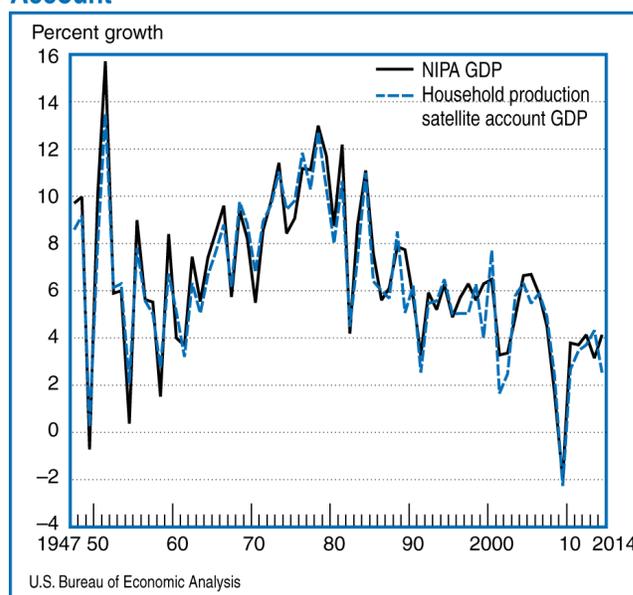


Table 1. NIPA and Adjusted Measures: GDP, Rates of Change, and Contributions to Growth, 1965 and 2014

	NIPA measures				Household production satellite account measures			
	1965	2014	Average annual rate of change	Contribution to GDP growth	1965	2014	Average annual rate of change	Contribution to GDP growth
	Billions of dollars		Percent		Billions of dollars		Percent	
Gross domestic product.....	743.7	17,348.1	6.6	100.0	1,021.0	21,345.0	6.4	100.0
Personal consumption expenditures and investment.....	443.6	11,865.9	6.9	68.8	756.1	16,412.1	6.5	77.0
Personal consumption expenditures.....	443.6	11,865.9	6.9	68.8	659.2	14,657.3	6.5	68.9
Nondurables.....	163.3	2,668.2	5.9	15.1	163.3	2,668.2	5.9	12.3
Services.....	213.9	7,917.5	7.6	46.4	491.2	11,914.5	6.7	56.2
Housing.....	76.6	2,142.6	7.0	12.4	76.6	2,142.6	7.0	10.2
Services of consumer durables.....	0.0	0.0	n.a.	n.a.	54.9	1,186.1	6.5	5.6
Depreciation of consumer durables.....	0.0	0.0	n.a.	n.a.	45.8	1,003.4	6.5	4.7
Return to consumer durables.....	0.0	0.0	n.a.	n.a.	9.1	182.7	6.3	0.9
Nonmarket services.....	0.0	0.0	n.a.	n.a.	222.4	2,810.9	5.3	12.7
Other.....	137.3	5,774.9	7.9	34.0	137.3	5,774.9	7.9	27.7
Consumer durables ¹	66.4	1,280.2	6.2	7.3	4.7	74.6	5.8	0.3
Investment.....	0.0	0.0	n.a.	n.a.	96.9	1,754.8	6.1	8.2
Residential.....	0.0	0.0	n.a.	n.a.	35.2	549.2	5.8	2.5
Consumer durables ¹	0.0	0.0	n.a.	n.a.	61.7	1,205.6	6.3	5.6
Gross business investment.....	129.6	2,860.0	6.5	16.4	94.4	2,310.8	6.7	10.9
Nonresidential fixed investment.....	85.2	2,233.7	6.9	12.9	85.2	2,233.7	6.9	10.6
Change in business inventories.....	9.2	77.1	4.4	0.4	9.2	77.1	4.4	0.3
Residential.....	35.2	549.2	5.8	3.1	n.a.	n.a.	n.a.	n.a.
Net exports.....	5.6	-530.0	-209.7	-3.2	5.6	-530.0	-209.7	-2.6
Government consumption and investment.....	164.9	3,152.1	6.2	18.0	164.9	3,152.1	6.2	14.7
Other aggregates								
Labor income.....	406.3	9,248.9	6.6	53.3	628.7	12,059.8	6.2	56.2
Personal income.....	570.8	14,694.2	6.9	85.1	848.1	18,691.2	6.5	87.8
Personal savings.....	58.3	620.2	4.9	3.4	74.2	822.4	5.0	3.7
Private investment.....	129.6	2,860.0	6.5	16.4	191.3	4,065.6	6.4	19.1
Gross savings.....	182.9	3,266.8	6.1	18.6	244.6	4,472.4	6.1	20.8

NIPA National income and product accounts
GDP Gross domestic product
n.a. Not applicable

1. Under current NIPA methodology, a portion of expenditures on "other motor vehicles and parts" are allocated as maintenance expenditures and are not capitalized in the fixed assets accounts.

purchases are volatile and follow the business cycle, so they tend to accentuate, rather than moderate, business cycles. Further, the weakness of the housing sector may contribute, since many durables (kitchen appliances, for example) are complementary to residential investment.

Labor Force Participation and the Household Sector

An aspect of the recent changes in unemployment rates has been the decline in labor force participation. Why this has occurred is still under discussion. However, declining participation adds potential workers in the home sector, just as increasing female participation reduced the size of the sector earlier.

As seen in chart 2, the recession coincides with a level jump in the share of men that do not work in the labor market. Unlike previous recessions, this increase has not declined much as the economy recovers. There are similar movements for women, but

Chart 2. U.S. Population Shares by Gender and Employment Status

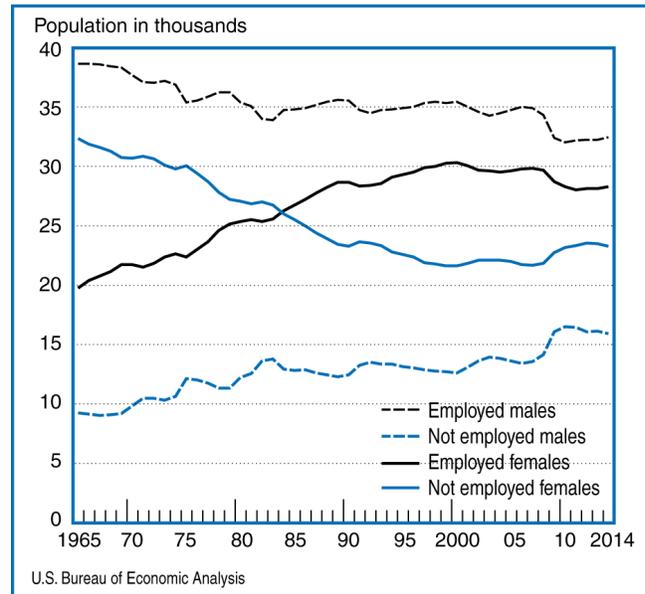


Table 2. Effects of Household Production on GDP and Components, 1965 and 2014

[Percent]

	Effect of adjustment on satellite GDP		Component shares of NIPA GDP		Satellite components share of satellite GDP	
	1965	2014	1965	2014	1965	2014
Gross domestic product	37	23	100	100	100	100
Personal consumption expenditures and investment	42	26	n.a.	n.a.	74	77
Personal consumption expenditures	29	16	60	68	65	69
Nondurables	0	0	22	15	16	13
Services	37	23	29	46	48	56
Housing	0	0	10	12	8	10
Services of consumer durables	7	7	n.a.	n.a.	5	6
Depreciation of consumer durables	6	6	n.a.	n.a.	4	5
Return to consumer durables	1	1	n.a.	n.a.	1	1
Nonmarket services	30	16	n.a.	n.a.	22	13
Other	0	0	18	33	13	27
Consumer durables ¹	-8	-7	9	7	0	0
Investment	13	10	n.a.	n.a.	9	8
Residential	5	3	n.a.	n.a.	3	3
Consumer durables	8	7	n.a.	n.a.	6	6
Gross business investment ¹	-5	-3	17	16	9	11
Nonresidential fixed investment	0	0	11	13	8	10
Change in business inventories	0	0	1	0	1	0
Residential ¹	-5	-3	5	3	n.a.	n.a.
Net exports	0	0	1	-3	1	-2
Government consumption and investment	0	0	22	18	16	15
Other aggregates						
Household PCE and investment share of GDP	n.a.	n.a.	60	68	74	77
Private investment share of GDP	n.a.	n.a.	17	16	19	19
Household investment share of private investment	n.a.	n.a.	0	0	51	43
Nonmarket services and services of consumer durables share of PCE	n.a.	n.a.	0	0	42	27
Labor income share of national income (GDP)	n.a.	n.a.	55	53	62	56
Personal saving rate (percent of personal income)	n.a.	n.a.	10	4	9	4
Personal saving rate (percent of personal disposable income)	n.a.	n.a.	11	5	14	6
Personal saving as percent of GDP	n.a.	n.a.	8	4	7	4
National saving rate (gross savings (percent of GDP)	n.a.	n.a.	25	19	24	21

n.a. Not applicable
GDP Gross domestic product
NIPA National income and product account

PCE Personal consumption expenditures
1. The apparent negative impacts of the adjustments are solely a result of the reclassification of residential investment and consumer durables.

they are less pronounced.

This shift has not prevented the decline in importance of the household sector relative to GDP. Including household production in 2014 would increase national output by 23 percent, less than the 26 percent in 2008. Since much of the decline in market work was driven by men, who spend relatively little time in home production, the shift is not enough to counteract the general decline of the household sector. The gap between working and nonworking men is also relatively small, so moving a man from the market to the home does not increase his hours much. Working men spent an average of 16.2 hours per week in household production, only slightly less than the 21.2 for nonemployed men. In contrast, the movement of women into market work had a big impact since there is a significant difference in hours that employed and nonemployed women devote to home production. Working women devoted 23.2 hours of household production compared with 33.2 hours for nonworking women in 2014.

Conclusion

This paper presents new estimates of BEA's satellite account of household production in the United States from 1965 to 2014. This sector has become less important over time. As a result, it had little impact on the decline in GDP during the most recent recession, and it actually slowed the recovery. These trends held up,

despite the decline in labor force participation. The exit of men from market work had little impact, as they perform about the same amount of housework whether or not they work.

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