Determining the Value of Household Production as a Component of Economic Damages[1]

By

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The forensic financial expert may be familiar with assessing lost profits, earnings capacity, or even valuing a business, but what is the expert to do about damages arising from lost ability to engage in non-market work? In a personal injury, wrongful death or similar tort cases, physical limitations may restrict market <u>and</u> non-market work the latter forming the basis for an additional source of damages. The issue can also arise in divorce cases.[3] If engaged by plaintiff counsel and the facts of the case suggest lost non-market work, the expert needs to know how to prepare such an assessment. If retained by defense counsel as an expert or consultant, one should be able to develop an independent assessment of household production damages and/or critique the opposing counsels' expert's methods and results. The point is lost household production value can be a significant part of compensatory damages; if done improperly, it opens the door to challenging the expert's testimony via tough cross-examination questions.

The goal of this paper is to provide a framework to enable the consulting financial expert to understand the steps involved in estimating household production value. There are six key steps:

1. Which measurement method to use and why
2. What household production activities to include in the valuation
3. How to value the selected activities

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[3] The author was contacted by a family law attorney in a recent and unusual divorce case. After lengthy bargaining and evaluations of family assets and income sources and just as the couple were ready to agree on a split of net worth, the wife, who lived near San Francisco found her husband, while married to her for 27 years, had also been married to another woman for nearly the same period! I was asked to value the divorcing wife's household production for the past 25 years as an added element of economic damages: What is the value of a Marin County housewife for a 25 year period?

4. How to update the valuation over time

5. Determining the length of the loss period

6. Making adjustments for self consumption.

Before presenting a discussion of each step, however, we offer a valuation perspective and a quick overview of three competing methodologies that have been suggested for valuing household production value.

Valuation Perspective

The productive use of time may arise in both labor market and non-market settings. In the labor market, the individual exchanges skilled services for a "rent" called compensation. In a non-market setting, we can divide time into leisure and non-market work. Non-market work includes activities you would be willing to pay someone else to do for you, i.e. grocery shopping, lawn mowing, etc. All other non-market activities, such as sleeping, bathing, eating, etc., we refer to as "leisure". All activities then fall into three categories: market work, non-market work, and leisure.[4]

Which measurement method?

Prior articles and books which discuss household production valuation issues refer to three approaches: the **replacement cost,** sometimes called the **specialist cost method;** the **market or opportunity cost method;** and, the **housekeeper method.** In the replacement cost approach, the valuation expert asks "What is the cost of hiring individuals to do each activity performed in household work such as food shopping, lawn care, housecleaning, etc.?" In the market cost approach, one asks: "What is the foregone market wage of a person for the time spent doing household production activities? If one person makes $100/hr in the labor market and it takes that person an hour to mow the lawn, the cost is $100 excluding capital, gas, etc. The so-called housekeeper approach is just that: What is the cost of hiring a housekeeper to do some or all non-market work?

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[4] While elegant this exhaustive division may not sit well with some observers. Joint production or the ability of a person to do more than one productive activity at the same time may present challenging measurement problems; however those challenges are more likely to involve activities within each of the

While all methods are used by forensic damages experts, the methods are not equally acceptable.

Replacement Cost / Specialist Cost Method

The replacement cost method requires the financial expert to know what household production activities would have been done "but-for" some event and the local market value of each activity. Special purpose surveys designed and conducted by the expert are expensive and time-consuming and rarely used; instead, the damages expert is likely to rely on time-use studies offered alone or in combinations with activity-specific market wages.

Market / Opportunity Cost Method

Leaving aside how to consider particularly thorny issues like possible commuting costs and tax issues, let's assume two homes in the same location with nearly identical families and lawn sizes. Again we'll use the grass cutting example and assume the husband takes an hour to cut the grass. In one home, the man is a brain surgeon making $400/hr and the other home the man is school teacher making $20/hr. In the market approach, the one hour needed to cut the grass "costs" $400 for one person vs. $20 in the second home, a result that may strike some as absurd. Few damages experts actually use the market approach but it's good to be prepared on the odd chance you may encounter such an expert in court.

Housekeeper Method

Similarly, the housekeeper approach requires knowledge of market wages for such workers but a housekeeper usually does not do all the tasks included in a basket of non-market work so this approach is not as accurate as replacement cost approach.

A 2003 survey of forensic economists found the following methods used to assess the dollar value of lost household services:

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three time categories rather than simultaneous activities across the market work, non-market work and leisure.

- Cost to replace activities lost   54.0%
- Market or opportunity wage   4.0%
- Housekeeper wage   10.4%
- Minimum wage   6.2%
- Combination or other   25.3%

This rank ordering is similar to the conclusion reached in a survey article, namely, "the specialist-cost technique is more accurate than pricing hours with the wage of a housekeeper and less controversial than pricing hours with opportunity wage." [5]

Which Activities?

Time-use surveys are widely-used to identify activities of household work. Differences in the surveys are due to where done (local or national), when done and type of household (intact husband-wife, single, or presence of children or elderly person). The employment status of adults in the household is also a key issue. Sometimes the financial expert may believe it appropriate to ask the plaintiff (or survivors) about the household production activities of the injured or deceased individual. This may add a measure of credibility but is generally not a good idea to base an analysis of household production value only on such interviews: time-use surveys are best left to the experts.

A time-use survey includes virtually all uses of time and the analyst needs to decide which activities to use in the analysis of household production. The following list is suggestive, "Yes" means to include, "No" means not to include, and "Maybe" means it depends on the facts of the case.

- Household Production (housework, food cooking & cleanup, outdoor chores, home & auto maintenance, purchase goods & services   "YES"
- Providing Care (child care, child guidance, playing with children, transporting children, providing care to others)   "MAYBE"
- Personal Care (grooming, sleeping, eating, etc.)   "NO"
- Employment or Education (includes commuting)   "NO"

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[5] John B. Douglas, Genevieve M. Kenney and Ted R. Miller "Which Estimates of Household Production are Best?" Journal of Forensic Economics 4(11), 1990, p. 28.

One of the best time-use surveys, e.g., national focus, recently-conducted, and including different family types, is the US Department of Labor's Bureau of Labor Statistics (BLS) American Time Use Survey (TUS).[6] Information on TUS is available either directly from BLS or in combination with activity-specific wage information, another BLS-supported survey, from ExpectancyData, Inc., <u>Dollar Value of a Day, 2003</u>.[7] The following table is drawn from that publication, Table 22, p.40.

Table 1. Household Production Value: Married females that work full-time, husband works, youngest child under age 13[8]

Time Use Category	(1) Weekly Hours	(2) Hourly Value	(3)=(1)*(2) Dollar Value of a Day	(4) Participation Rate
Inside Housework	6.29	$10.00	$8.99	59.9%
Food Cooking & Cleanup	5.53	9.53	7.53	72.7
Pets, Home & Vehicle	1.39	11.62	2.30	20.8
Household Management	1.04	14.24	2.11	25.1
Shopping	3.27	11.19	5.23	51.1
Obtaining Services	0.14	12.65	0.25	4.0

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[6] See BLS Web site, www.bls.gov/tus/home.htm for American Time Use Survey microdata.
[7] K. Krueger & J. Ward, <u>Dollar Value of a Day, 2003</u>, ExpectancyData, Inc. Shawnee Mission, KA, 2005.
[8] <u>Weekly Hours</u> is average time in hours where the activity category describes the main activity performed by the respondent. Weekly hours is sum of average Sunday & Sunday hours plus five times average weekday hours. <u>Hourly values</u> are for Occupational Employment Survey. <u>Dollar value of a day</u> is weekly hours times hourly value divided by seven. <u>Participation rate</u> is percent of population reporting at least one daily occurrence of the activity. HH refers to Household.

Travel for HH	2.40	11.69	4.01	57.4
HH Production	**20.06**	**$10.62**	**$30.43**	**93.7%**
HH Children	10.32	10.46	15.43	78.6
HH Adults	0.17	10.88	0.27	7.3
Non-HH Members	0.45	10.92	0.70	12.2
Travel for HH	2.13	12.48	3.79	38.0
Non-HH Travel	0.42	12.48	0.75	10.9
Caring/Helping	**13.49**	**$10.86**	**$20.93**	**81.7%**

For similarly-situated males, household work and work value is as follows:

Table 2. Household Production Values: Married males that work full-time, wife works, youngest child under age 13

Time Use Category	Weekly Hours	Hourly Value	Dollar Value of a Day	Participation Rate
Inside Housework	1.62	$10.00	$2.31	22.8%
Food Cooking & Cleanup	2.17	9.53	2.95	43.4
Pets, Home & Vehicle	4.37	11.62	7.25	32.9
Household Management	1.08	14.24	2.20	20.6
Shopping	2.30	11.19	3.67	41.0
Obtaining Services	0.11	12.65	0.20	2.3
Travel for HH	2.10	11.69	3.51	46.0

Activity				
HH Production	13.74	$11.25	$22.09	79.53
HH Children	6.22	10.46	9.29	57.6
HH Adults	0.21	10.88	0.32	6.8
Non-HH Members	0.72	10.92	1.12	10.0
Travel for HH	1.16	12.48	2.07	25.8
Non-HH Travel	0.37	12.48	0.65	8.9
Caring/Helping	8.67	$10.86	13.46	63.6

Tables 1 and 2 provide baseline data which may be used as presented for Household (HH) Production and possibly Caring/Helping for the type of households described in the titles or if there are some reasons to believe the case involves special circumstances; for instance, a married female whose spouse works and the youngest child is under age 13 for a family in rural Montana where the female travels more than 2.40 hours per week for HH Production, then the expert may wish to substitute actual travel time. Additional information for different types of households, more than 90 tables, can be found in Dollar Value of a Day, 2003.

Annual values of household production for a married female whose husband works and youngest child is under age 13 is $30.43 per day or $11,107 per year in 2003 dollars. For a married male in a comparable situation, the 2003 value is $8,063 per year. Annual values are obtained by multiplying day values by 365 days.[9]

Each assessment in Table 1 and 2 assumes total lost household production ability perhaps due to total disability or death. Yet partial disability may be present on a permanent or temporary basis. For example, if a physician or other medical expert says the injured person can only perform 60% of what could be done before the injury-causing event, then 40%, not 100% should be assumed as the appropriate lost household production

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[9] Some experts prefer to annualize by multiplying by 365.25 to adjust for leap years.

limitation factor. In this case, for example, the annual married female production loss value in Table 1 would be $11,107 * (1-.6) or $4,442.80.

If providing care for children or adult family members is a factor, then up to $20.93 per day could be added to household production value for the married woman data in Table 1. In this context, the financial expert may wish to find out which of the activities listed fit the case and use only those. Alternatively another type of customization may involve choosing only those activities which have participation rates which meet some threshold. If for example, the threshold were 50%, then household production value for females in Table 1 would just include Inside Housework, Food Cooking & Cleanup, and Shopping or $21.75 per day. While reasonable, however, this may be too conservative because participation rate in TUS is measured as doing at least one daily episode of the activity and some activities while not done daily may be essential such as buying gas for the family car.

Customization of analysis is the main point and that can be extended. If the forensic expert has evidence from the facts of the case that warrant use of average weekly hours different from those shown in Tables 1 or 2 that should be done. Similarly, if some activity is not listed in Table 1 but relevant to the case, the expert may wish to add hours in that activity per day weighted by an appropriate wage rate.

What values of Household work activities?

The wage information contained in Tables 1 and 2 is from the Occupational Employment Statistics (OES) program that produces employment and wage estimates for over 800 occupations. These are estimates of the number of people employed in certain occupations, and estimates of the wages paid to them. OES wage estimates are available for the nation as a whole, for individual States, and for metropolitan areas; national occupational estimates for specific industries are also available.[10] Other BLS wage data by area and occupation are from the National Compensation Survey or the Current Population Survey. The OES, however, is particularly well-suited to forensic financial

analysis for moment-in-time estimates because it includes local pay by occupations in household production activities. One finds such data either from BLS or from any state labor market information agency because the program is conducted in cooperative agreements with each State. Private data sources are also available from organizations like Economic Research Institute (ERI) of Redmond, Washington.

Updating Household Production Values?

In general, one begins an estimate of lost household production value with a base value from the year of a limiting event. If data for that particular year is unavailable, the expert will have to make adjustments. Household production values may change over time due to different time weights or different wage weights. Non-market work changes may be due to different cultural and social attitudes about work at home, changes in rates of labor market participation, gender roles, technology, family income, education, and health. These factors are normally considered outside the realm of the financial expert at least in a forensic setting. Still, the opportunity exists for the expert to offer their client challenging questions for cross-examining an opposing expert based on when and where the data on household work was obtained. For example, a number of studies of household work, still used in the courts today, were conducted more than 30 years ago with unique characteristics such as one location like Syracuse or Ithaca or one family-type such as only intact husband-wife families. Between 1996 and 2004 many changes have taken place in the US work force such as the percent of women working increasing from 43.2 percent to 56.0 percent, nearly a 30% change.[11] Technology has obviously changed dramatically since 1976. Specifically, results of a recent study of trends in HH work, found an overall decline of 12 hours per week for women between 1965 and 1995, from 30.0 to 17.5 hours, primarily due to increased labor force participation, later marriage, and fewer children. In contrast, men's household work almost doubled during this period, a 5 hour per week increase, from 4.88 to 9.95 hours.[12]

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[10] See www.bls.gov for Occupational Employment Statistics Overview.
[11] See www.bls.gov Web site for female labor force participation history.

[12] Suzanne M. Bianchi; Melissa A. Milkie; Liana C. Sayer; John P. Robinson "Is Anyone Doing the Housework? Trends in the Gender Division of Household Labor" Social Forces, Vol.79, No.1 (Sep., 2000), pp.191-228.

Other updating considerations are the age of the adult, work status of spouse, family composition, age and presence of children. For instance, from Table 2, we have the situation of a female full-time worker with a working husband and child under 13 whose daily household production value is $30.43. If the loss continues for several years and work status of the adults does not change and the youngest child now is from 13 to 17 years, then the value is $34.39.[13] Once that child leaves home, HH production values of the female will then decline.

Implicit in the above discussion is also the need to adjust the earnings weights to reflect current conditions. The OES data used in Tables 1 and 2 are only cross-sectional. Moreover, because of how OES data are collected and reported in pooled three year averages, it is not appropriate to update household production values for different years simply by taking OES results for different years. Instead, the preferred way to update the value of household production values is to use a wage change index like the Services Occupation in the Employment BLS Employment Cost Index (ECI) or some other wage index measure. Some analysts may argue that the Consumer Price Index (CPI), also published by BLS, is an appropriate change index since many wage and salary structures use the CPI as a cost of living adjustment (COLA) and the CPI has detailed price change information on categories like Household Operations. For example, from Table 1, the dollar value of a day for a married female, husband working, youngest child under 13 was $30.43 in 2003 dollars. To express this value in 2005 terms using the CPI we use the following steps:

1. Select appropriate CPI category. For expository purposes we use the U.S.City Average CPI-W, for Household Operations (Series id CWUR0000SEHP).

2. Compute the change in selected index for period in question. In this situation we wish to update 2003 values to 2005. However, we only have partial year data for 2005, up to July 2005, available. The Housing Operations CPI for July 2005 is 133.0, so we compute the change from July 2003 (index of 119.7) to July 2005 as follows:

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[13] <u>Dollar Value of a Day, 2003</u>, Table 25, p. 43.

        a.   (133.0-119.7)/(119.7)*100 = 11.11%

  3.   Update the base year value using CPI change as follows: dollar value of $30.43 in 2003 is $30.43*(1.111) = $33.80 in July 2005 dollars.

To recap, the careful financial expert needs to select an appropriate time-use survey which includes household production time; consider any modifications or additions which might be needed such as dropping or adding activities based on facts of case; select appropriate replacement wages based on OES or similar occupation-specific wage; and update the HH production values to present and future periods to reflect changes in HH hours worked associated with factors like age and presence of children, employment of spouse, own age, AND expected changes in HH replacement costs. The latter step, projecting future changes in household production wages, varies amongst experts. A frequently-used way is similar to the updating example we just presented with the added proviso that in projecting future average price changes, one computes an historical average from a past period at least as long as the future period being forecast and uses that average as the basis for making the future projection.

Adjustments for Loss Period

A standard issue in damages assessments is the length of the loss period. For HH production there are several choices to be made depending on the facts of the case. To simplify, we assume total disability in the following discussion. First, if the period of inability to perform work is temporary, one would use that time period to compute market and non-market damages. Second, if the loss is permanent, many financial experts use life expectancy to compute foregone HH production values. Others challenge this view arguing it is more appropriate to deduct the last 10 years entirely or via a straight-line deduction for the last few years of expected life. Both adjustments recognize that a person in their 70s or 80s is unlikely to be as healthy and able to do work activities as a younger person. While intuitively appealing the data on aging and HH work is not entirely clear.

The BLS time use study used as basis for Table 1 and Table 2 and reported in Dollar Value of a Day, 2003, includes HH production by age and gender. Females 75 and older

spent 25.84 hours in HH production in 2003 vs. 24.31 hours for females ages 25 to 44. For men ages 75 and over, HH production was 18.48 hours vs. 14.32 hours per week for males ages 35 to 44.[14] It may be that the same activities take longer when one is older perhaps due to physical limits or that younger individuals simply take less time to do the same activities due to the competing time needs arising from child care and jobs.

A promising alternative to arbitrarily discounting some future HH production years entirely or via some "depreciation-type" method, comes from another study by economic demographers, Kurt Krueger and John Ward of ExpectancyData, Inc. These authors computed "Years of Healthy Life" and "Full Function Life" as alternative measures of lifetime HH productive capacity.[15] Healthy life expectancy combines mortality (life expectancy) and morbidity (health status) into a single measure. It provides a range of functional capacity by age including a maximum "Full Function Healthy Life Expectancy". For example, a 50 year old white male has 28.43 years of life expectancy, 21.87 years of healthy life expected, and 25.31 years of full function life expected.

Adjustments for Self-Consumption

In computing damages in wrongful death cases, a common practice is to deduct self-consumption from market earnings since that is not a net loss to survivors. A logical extension is to do the same for HH production values. Exactly whether and how to make this adjustment is a challenge which Gerald Martin in his book Determining Economic Damages[16] addresses with the following list of advice to attorneys, a list that applies to experts as well:

1. Check the law in your jurisdiction (governing self-consumption).

2. Get a list of all family members.

3. Get a list of all dependents.

4. Get exact birthdates of all family members and dependents.

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[14] *Op.Cit*, Tables 90, 86, 81, and 77.
[15] Healthy Life Expectancy, 2001 Tables, Expectancy Data, Inc., Shawnee Mission, KS, 2004.
[16] Gerald D. Martin, Determining Economic Damages, James Publishing Inc., Costa Mesa, CA, Rev.16, July 2005, p.534.

5. Learn whether any children are handicapped or infirm and will need lifetime support.

6. Learn whether the children will go to college.

7. Learn if there are any circumstances that would cause family to depart from normal spending patterns.

After obtaining the data in the above checklist, the key issue is to compute how much of HH production value would have been consumed by the deceased individual. The answer to this simple question is frustrated by factors like economies of scale in purchasing and indivisible consumption. The latter refers to the difficulty of assigning to one person their share of costs for utilities, appliances, shelter, garbage pick-up, newspapers, cable TV, property tax, etc. While there is no one best way for the financial expert to follow, there are several empirical studies which Dr. Martin summarizes in his book as follows:

Table 3. Support and Consumption Factor: Income Support Required Following Death of Parent/Spouse (data in percentages)[17]

Number of children	Indivisible Expense Item	Consumption: Each Parent	Consumption: Each Child	Support Factors for loss of one parent/spouse
None	38.0	31.0	0.0	69.0
One	38.0	23.9	14.2	76.1
Two	38.0	20.1	10.9	79.9
Three	38.0	15.1	10.7	84.9
Four	38.0	12.4	9.3	87.6
Five or more	38.0	10.7	40.5*	89.3

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[17] Martin, *loc.cit*, Table 22c, p.520.

(*for 5 or more children, divide 40.5 by the number of children to find factor for each child)

To use the information in Table 3, the expert first needs to compute a prospective age-based composition of the family. For example, if a wife dies leaving a husband and a 12 year old child who is not expected to attend college, one would begin with deducting 23.9% of HH production value when the child was 12, but change this self-consumption factor to 31.0% at the time the child is expected to leave home, perhaps at age 19. To be more specific, assume the wife died in 2003 and recalling information from Table 1, from which we estimated annual HH production as $11,107, we are now saying that the net HH production value is $11,107 times 76.1% or $8,452. Over time if we expect (a) the value of HH production after 2003 to increase at 3%/yr and (b) we further assume the child leaves home in seven years, and (c) we know HH production value of married females that work full-time, husband works, no children under 18 is $30.71 * 365 or $11,209/yr, the 2010 value of HH production is $(1.03)^7$ times $11,209 or $13,787. We then have to make an adjustment for self-consumption, in this situation for a husband-wife family with no children, or 31.0% self-consumption to arrive at a net loss of $9,513 in year 2010. In a similar manner, the financial expert needs to make adjustments for changes over time in HH hours, replacement costs, and household composition for each time in the loss period.

In summary, the forensic financial expert is encouraged to do the following things to prepare for an analysis of household production value as a part of economic damages. First, check with the attorney/client to make sure such a valuation fits the facts of the case and the venue. Sometimes the attorney may be unfamiliar with non-market work valuations in which case the expert can provide a service by suggesting such be considered. Next, the expert needs to be prepared to defend choice of (1) which valuation method was used and why; (2) what household activities were considered (this may involve choice of time-use and wage survey); (3) which update method; and (4) possible self-consumption allowance. As always, the expert should be reasonable, conservative and acknowledge the limitations of the analysis if asked; but if the expert follows the steps outlined here, they should be a long way towards being thoroughly prepared for

their own direct testimony or providing challenging questions for opposing experts doing household production valuation.