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Valuing Household Services: A New Look at the Replacement Cost Approach

Matthew J. Cushing* and David I. Rosenbaum**

Abstract: *Economists are called upon to assess the loss of household services in personal injury and wrongful death cases. One frequently used method for doing this is to value the labor hours spent on household services at market wage rates. **A** less often used alternative values the actual services produced at retail market prices. This paper develops a new technique Jr valuing services at retail prices. It then investigates the relative divergence between the wage rate and retail price approaches. The analysis indicates that valuing the actual retail services produced generates estimates significantly larger than those generated **by** valuing labor hours.*

I. Introduction

One typical component in a personal injury or wrongful death analysis is the loss of household services. Adhering to economic principles, the valuation of non-market production should assess nonmarket outputs as if they were created and consumed in markets (Abraham and Mackie, **2005).** Pricing outputs on the market, however, requires the existence of a market for them (Chadeau, **1992).** In some cases, markets are nonexistent; in other cases, market data may be difficult to obtain (Chadeau **,1992;** Abraham and Mackie, **2005).** Even when markets exist, the benefits and quality of household production may not **be** easily evaluated **by** surveys or observations and must be computed indirectly (James, Jr., **1996).** Unsurprisingly, the first economists who attempted to value non-market household output in the 1920's produced such crude estimates that policymakers discounted its importance until interest resurged in the later part of the **20th** century (James, Jr., **1996).** Since then, published non-market valuation

***** Professor of Economics, University of Nebraska, Lincoln **NE 68588-0690,** 402-**472-2323,** mcushingl @unl.edu.

****** Professor of Economics, University of Nebraska, Lincoln **NE 68588-0690,** 402-472-2318, drosenbaum@unl.edu.

research has focused on introducing new methods to best value household production (Smith and Pattanayak, 2002).

Current efforts to value household activities use imputation methods to value the time spent in non-market production (Zick and Bryant, **1990;** Bryant et al., **1992;** Landefeld and McCulla, 2000; Trewin, 2000; Ironmonger, 2001; Hamdad, **2003;** Folbre, **2008).** Time devoted to household production is the salient unmeasured quantitative term, and time use surveys are the most popular method for recording the number of hours devoted to household production

(Expectancy Data, **2011;** Chadeau, **1992;** Abraham and Mackie, **2005;** Pratt, **2009;** Foibre et al., **2005).** After statistics are collected on time spent in nonmarket production, a dollar value is assigned to each activity and multiplied **by** the number of hours to estimate value. Methods that monetize household production differ in the dollar value assigned to particular activities. At the crux of the difference is whether household production should reflect **(1)** the economic cost to the individual or (2) the market wage of workers who perform the activity. Two widely applied imputation methods-the opportunity cost method and the replacement wage method-reflect this debate (See Chadeau, **1992;** Pratt, **2009).**

The opportunity cost method values time devoted to household production at the rate an individual could earn in the market (Becker, **1965;** James, Jr., **1996;** Abraham and Mackie, **2005;** Pratt, **2009).** The market wage of the individual may be difficult to determine, however, if the individual is not employed in the market. In these instances, either the minimum wage or the median wage may be used as a proxy (Folbre et al., **2005).** An advantage of using the opportunity cost method is that it underscores the subjective value individuals place on their time (Kahneman, et al., 2004).

The replacement wage method values household production time at the wage of a hired worker who performs the work (Expectancy Data, **2011;** James, Jr., **1996;** Abraham and Mackie, **2005).** The replacement wage method compensates tort victims for the work they or their deceased would have performed as **if** they were domestic workers in their own employment. This approach is more widely used in studies of household time (Pratt **2009,** Brookshire, et al., 2012).

Recent studies reflect an interest in developing a new approach that provides a more accurate estimate of the final value of household production. Folbre et al. **(2005),** for example, note that more holistic estimates should include employer contributions beyond wages, such as healthcare and other benefits. Smith, et al. (2010) advocate for a markup over wage rates that reflects the cost of obtaining retail services.' Abraham and Mackie **(2005)** assert that household capital and production expenses should also be accounted for in household

services valuations. It follows that a new approach is to value household services at the final or retail prices consumers pay in the market, accounting for household capital, raw materials, and labor hours (Abraham and Mackie, **2005).** Valuing services at their market prices not only provides a more holistic evaluation of household production, but also eliminates many current methodological issues **by** eliminating discrepancies caused **by** the wage effect. In this paper we explore the divergence between valuations using market wages versus retail market prices.

Measuring the divergence is important because while the market

wage method is most frequently used **by** economists, it may be market prices that are more conceptually relevant. An injured person typically would not hire a collection of people as part time employees to perform a variety of services. Rather, it is more likely that the injured person would have to purchase at least a subset of those services through market vendors at retail service prices. Valuing services at retail prices may be more reflective of how an individual claiming damages would replace lost household services.

A starting point for the analysis is The Dollar Value of a Day developed **by** Expectancy Data **(2011).** The Expectancy Data study combines time use information with market wages to value time spent in a variety of household activities.[2] It is an estimate of the amount it would cost a person to hire part-time employees to perform household services as a form of employment. The typical answer to replacing those household services on a retail market starts with measuring output of household services. The outputs are then valued at retail prices per unit of output. Unfortunately, measures of household production, as well as output price series, are difficult to get. The paucity of data must certainly limit the use of this methodology.

We suggest a new approach to valuing household production at retail prices. Rather than start with output, start with the hours spent on household services. This is the same starting point as the wage approach to valuing household services. Data showing hours spent on household activities are much more commonly available. In this analysis, for example, we start with the same activity categories and hours from the Expectancy Data report. We then go on to develop a series of hourly retail prices that consumers would pay if they were to purchase equivalent services on a retail market. Hours of activity are combined with the adjusted hourly retail price measures to provide an initial estimate of replacing household services through a retail service market.

Two adjustments are then made to the initial estimates. One adjustment accounts for inputs no longer used in personal production of household services. The other adjustment accounts for productivity

differences between an individual and a retail service provider. This "retail market" measure of household services certainly is not without its shortcomings. It ignores multitasking in production of household services. However, the same shortcoming is inherent in other methodologies. Both approaches also encounter difficulties when the services are not readily available on a market or when services are provided **by** family members. They also suffer from potential divergences between services provided on average across a sample of individuals and services actually provided **by** an injured or deceased party. Never-the-less, the results of the retail market approach and their comparison to the hourly wage approach are interesting.

The results show that when household services are valued at retail prices, the resulting value of household production is at least eighty percent larger than when services are valued using wage rates. Granted the results are not ubiquitously applicable in that they reflect retail prices in one Midwestern city. However, the results are useful in that there can be a range of estimates for the value of lost household services. Given the alternative approaches, these results also suggest that the more common approach of valuing services using wage rates may produce relatively conservative estimates.

In the next section, we discuss the rationale behind the alternative methods for valuing household services. The various measures are developed, compared and contrasted in section **III.** This is followed **by** a conclusion.

II. Alternative Valuation Methods

The economic literature on valuing household services contains two general approaches, the *Labor Value Approach* and the *Direct Output Approach.* [3] The Labor Value Approach values hours spent on household services. It begins **by** measuring an individual's time spent in a variety of household service activities. The hours in each activity are then valued at the market wage rate for someone employed in a firm producing that activity. For example, if an individual spent four hours a month cleaning windows and the prevailing wage paid to employees of window cleaning companies was **$10** per hour, the monthly value of window cleaning as a component of household services would be $40.

There have been a number of fairly comprehensive studies of hours spent in household service.[4] One such study is The Dollar Value of a Day (DVD) **by** Expectancy Data **(2011).** DVD is based on time use data covering more than **100,000** individuals from all **50** states.[5] Wage data are compiled from two sources, either data from the Bureau of Labor Statistics or the March supplement of the *Current Population Survey.*

The second approach is the Direct Output Approach. This approach values household output rather than hours spent at an activity. It begins **by** measuring an individual's output produced in a variety of household service activities. Each output is then valued at the retail or market price charged **by** firms producing that output. For example, if an individual cleaned ten windows a month and the prevailing market price was $4 per window, the monthly value of window cleaning as a component of household services would be $40. In essence, the Direct Output Approach measures the cost of replacing those household services on a retail market.[6]

Each approach has advantages and shortcomings. The Labor Value Approach is easier to use in that data are more readily available. Ireland and Ward **(1991),** however, outline some underlying concerns with using a Labor Value Approach, as do Douglass, et al. **(1992).** Among them are: the Labor Value Approach ignores the value added

from other inputs; a labor hour may produce multiple outputs - for example, cooking and watching children; it may be difficult in some cases to distinguish between labor and leisure activity - gardening for example. Another drawback is that professionals may use a different technology mix than individuals.

A significant drawback to the Direct Output Approach has been a lack of available data. This applies to measures of both output and market prices for those outputs. Yet the Direct Output Approach has its advantages. In particular, it may more accurately portray how lost household services are replaced. An injured person would have to purchase through a retail market at least a subset of services they could no longer perform. Rather than hire a window cleaner as an employee at the rate employees of window cleaning companies would earn, an injured person would have to hire a company to clean the windows.

This research suggests a variation of the Direct Output Approach that mitigates one of its drawbacks. Rather than start by measuring output, start by using the more commonly available hours of activity. These are the same hours used in the Labor Value Approach. This solves half of the data scarcity problem. Then develop retail prices for those services, making adjustments where necessary. The data are then combined to value household services via the Direct Output Approach.

III. Developing the Measures

A. The Labor Value Approach

The DVD study combines time usage information with wage data to place a dollar value on time spent during a day. The DVD usage

Table 1. DVD 2010 Value for Household Production

ATUS Subgroup	Weekly Hours	Cost/hr ($)	Value ($)
Inside Housework	**5.77**	**$10.86**	**$8.95**
Food Cooking & Cleaning	5.49	**$10.72**	$8.41
Pets, Home and Vehicle	**1.36**	**$12.71**	$2.47
Household Management	1.02	$15.84	**$2.31**
Shopping	**3.21**	**$11.55**	**$5.30**
Obtaining Services	**0.09**	***$13.56***	**$0.17**
Travel for Household Activity	**2.17**	$12.46	**$3.86**
Household Production Subtotal			$31.54

data are derived from Bureau of Labor Statistics' (BLS) American Time Use Survey (ATUS). The ATUS survey data were collected from interviews. Respondents were asked to describe their activities over a 24-hour period. The tasks were then coded into 431 six-digit microcategories. The micro-categories are combined into 27 subgroups. The subgroups, in turn, are categorized into five major categories: household production, caring and helping, personal time, leisure, and work and education.

Three of the five major categories in the ATUS are not typically thought of as market valued household services that are provided to

others. *Personal time, leisure and time spent on work and education are* consumed **by** the individual alone. The fourth area, *caring and helping,* has very thin markets, both for the outputs and for the labor market. Therefore, this analysis focuses initially on the primary major category, *household production.*

Wage data in the **DVD** analysis were obtained from the **U.S.** Department of Labor's, Bureau of Labor Statistics', Occupational Employment Statistics survey **(OES).** The **OES** May 2010 survey covers **823** occupations. According to Expectancy Data, "[t]ime is valued using the hourly wages plus the employer's legally required benefit costs paid to persons whose employment requires them to perform work similar to many of the activities that people perform for themselves throughout the day." 9

To develop a wage for each subgroup, DVD starts with the mean wage for each **OES job** title within that subgroup. **A** weighted average wage for the subgroup is calculated, where weights are based on relative employment in each **job** title. The DVD regional aggregate wage adjustment factor is used to make the data more region specific.' 0

The **DVD** data are shown in Table **1.** These figures are for a married female that works full-time, youngest child under age **13.** The first

column shows the hours per week as taken from the DVD publication. The second column shows the 2010 wage cost per hour. The third column shows the daily value of each consolidated activity and is calculated as the weekly hours divided **by** seven (to get average daily hours), times the hourly wage. The *Household Production major* category is composed of seven subgroups. Collectively, the dollar value of a day for household production is $31.54. This represents the Labor Value Approach to valuing household services.

B. The Direct Output Approach

This analysis deviates somewhat from the standard method for determining the Direct Output Approach to valuing household services. Rather than measure output and retail price per unit of output, we use the retail price per hour of providing services. An advantage of this method is that we do not have to measure output. Rather, we can start with the more widely published measures of **hours** in each activity. Hourly retail prices are multiplied **by** the DVD hours of services to develop a retail price-based value of the services produced.

To develop retail prices, extensive phone surveys were conducted of firms providing a variety of household services in Lincoln, Nebraska - a mid-sized Midwestern city. The survey was done in the summer of 2010 and reflects 2010 prices. To begin with, the Lincoln telephone directory and online resources were used to gather the names and phone numbers of local businesses that potentially would provide services comparable to the **ATUS** micro-categories within each service

subgroup. Each company on the list was called to verify if they did indeed provide such service. **If** they did, they were asked to provide an hourly rate for their services. While all companies on the list were called, some refused to answer our survey or **did** not provide the service. The overall response rate was approximately **67** percent. Aggregation of the developed retail prices is shown in Appendix **A** where there is one table for each Household Production subgroup. For expository purposes, the retail price table for the subgroup "Inside Housework" is reproduced in Table 2. The uppermost part of the table shows the five **ATUS** six-digit micro-categories included in the subgroup Inside Housework. These are 020101 Interior Cleaning; 020102 Laundry; **020103** Sewing, Repairing and Maintaining Textiles; 020104 Storing Interior Household Items, including Food; and **020199** Housework, n.e.c. The middle section in Table 2 shows information on the service categories for which retail prices were found. For Inside Housework, there were eight service categories ranging from *Maid Services to Movers.* This section of Table 2 shows survey results for the minimum hourly price, the maximum hourly price, the number of firms

Table 2. Expanded Retail Prices for Inside Housework

ATUS Activity
020101 Interior Cleaning 020104 Storing interior **hh** items, inc. food
020102 Laundry **020199** Housework n.e.c.
020103 Sewing, repairing, & maintaining textiles

Retail Service Category	**Weight**	**Min.($)**	**Max.($)**	**N**	**Mean($)**
Maid *Services*	**156,688**	**30**	**86**	**9**	**$49.75**
Window Cleaners	**156,688**	**40**	48	**3**	$42.00
Carpet and Rug Cleaners	**156,688**	**52**	**185**	***25***	**$111.82**
Curtain Cleaners	**156,688**	**3**	***5***	2	**$3.90**
Furniture Cleaners	**156,688**	**90**	**100**	2	**$95.00**
Laundry Cleaners	175,224	**8**	22	**11**	**$13.91**
Tailors and Menders	41,669	**16**	44	**9**	$34.94
Movers (one person-hour and a truck)	**105,380**	**30**	***53***	***15***	**$38.00**
Mean	**$48.67**				
Weighted Mean	***$50.00***				

OES Occupations Used to Value Activity at Wage Rate
Maids and housekeeping cleaners; Locker room, coat room, and dressing room attendants; Baggage Porters and bellhops; Laundry and dry-cleaning workers; Pressers, textile, garment, and related materials; Sewing machine operators; Sewers, hand

providing survey answers and the average price in each service category.

Because the basic unit of measure for the included activities is hourly, attempts were made to get an average hourly rate charged for each service. In some cases, a business would provide rates on an hourly basis. In other cases, information was provided on a per **job** basis or **by** some other basic unit such as square footage. In those cases, we asked the provider to estimate an average cost per **job** and average number of hours per **job** or an average square footage per **job** and then an average number of square feet per hour, which we could then convert to an hourly rate. Carpet cleaning is an example. One

provider charged 20 cents per square foot. He estimated he could clean 400 square feet in an hour for an implied rate of **$80** per hour.
Two retail prices are developed. The first is the simple average of all of the retail service categories within the **ATUS** subgroup. This value of **$48.67** is shown near the bottom of Table 2 for the Inside Housework. **A** weighted mean is calculated as well. The weights are derived from **2007 NAICS** industry employment figures." In cases where more than one service category falls into one **NAICS** code, the employment is split evenly among the categories. The weighted mean
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of **$50.00** is shown near the bottom of Table 2 for the Inside Housework.
The bottom section of Table 2 shows the **OES** occupations that were used to calculate the average wage under the Labor Value Approach. The **OES** occupations were not used in valuing services via the direct output approach. However, it is interesting to compare the **OES** categories used in the Labor Value Approach to the retail service categories proposed for our estimate of the Direct Output Approach. The **OES** categories can be significantly different than the retail service categories.
The compelling reason for not using the **OES** categories in this study is the fundamental difference in the nature and purpose between **OES** categories and retails markets. The **OES** categories are organized based on employment. Looking at table 2, for example, there are over 44,000 people employed as baggage porters and bellhops. But a widow trying to replace services performed **by** her deceased husband would hire neither a bellhop nor a baggage porter. She would have to hire a mover, which is reflective of services available in a retail market. Similarly, it is doubtful that she would have needed to hire a "locker room, coat room, and dressing room attendant". She would be much more likely to hire someone to do cleaning or mending.
Appendix **A** shows the comparable **OES** occupations and retail service categories for the other six service subgroups. In some cases, the two are fairly similar; consider the subgroup "Travel for Household Activity", for example. Other subgroups, "Food Cooking and Cleaning" for example, are fairly different.
Table **3** aggregates the information across all seven subgroups included in the major category household production. Column **(1)** in Table **3** shows the weekly hours of production in each subgroup. Columns (2) and (4) show the value of an hour using retail services from our surveys in the Direct Output Approach. For ease in comparison, column **(6)** shows the value under the standard Labor Value Approach. The weekly hours are divided **by** seven to get a daily value, and then multiplied **by** the hours spent in each activity to derive the preliminary daily value of activities in each subgroup. These results are shown in columns **(3),** ***(5)*** and **(7).** They range from less than one

dollar for Obtaining Services to more than $40 for Inside Housework. Daily values are aggregated across the seven subgroups to derive estimates of the dollar value of a day spent doing Inside Housework. The two Direct Output Approach estimates are in the range of $140. Under the Labor Value Approach, the daily value of household production is about $31.54.

Two adjustments still need to be made to the Direct Output Approach valuations. First, when services are purchased on a retail

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market, the individual avoids expenditures on other inputs necessary to perform those tasks. These avoided expenditures must be accounted for. Second, professionals may use a different technology mix that would allow them to be less labor intensive than an individual. This needs to be accounted for as well.

To account for the first adjustment, expenditures on other inputs that are no longer necessary are developed from the Consumer Expenditure Survey **(CES).** [12] These expenditures include expenditures on: household operations; housekeeping supplies (excluding postage and stationary); maintenance, repairs, insurance and other expenditures on an owned dwelling; and pets, toys and playground equipment.[13] **CES** year **2009** figures are inflated to year 2010 values using the **CPI.** This cost is $4,384.

If a person obtains their own goods and services, they would need a car. **If,** on the other hand, they were to hire these services in a retail market, they may not need a car for those services.[14] The **CES** estimates that annual expenditures for purchasing, financing and insuring a car are **$6,010.15** Operating costs (gas, oil and maintenance) are estimated at ***$3,665.*** At an average of **15,000** miles per year, variable operating costs come to 24.2 cents per mile. The city of Lincoln estimates that the average rate of travel within the city is **31** miles per hour. Multiplying this **by** the implied miles spent on Travel for Household Activities as shown in Table **3,** the relevant annual operating costs are **$855.16**

Household and automobile expenses combine to $11,248 annually. Dividing this **by 52** weeks and **by** the number of hours per week spent on household activities generates an avoided cost of **$11.28** per hour or **$30.91** per day.[17] This figure is shown in the third row from the bottom of Table **3.**

A second adjustment to hourly retail prices is needed. Businesses may use a technology mix that allows them to be less labor intensive than households in performing household services. Hence hours performed **by** a household may vary from hours performed **by** a retail business. Fitzgerald and Wicks **(1991)** look at time spent **by** households versus retail firms. In their Table 2 they compare productivities in **52** different household activities. When there are statistically different productivity differences, firms are generally more productive than individuals. However, for many activities there is no statistical difference in average labor productivities. Looking at their data as a whole, firms are roughly **25** percent more efficient than individuals. To adjust for the productivity difference, the raw retail costs in Table **3** less forgone purchased goods and services are adjusted downward **by 25** percent. This downward adjustment is shown in the penultimate row of Table **3.**

C. Comparison

At this point it is possible to compare the dollar value of a day from the Labor Value Approach to the Direct Output approach. These results are shown in the last row of Table **3.** Using the Direct Output Approach, household production is valued at from **$77** to $84 per day. In contrast, using the Labor Value Approach, household production is valued at **$32** per day. The Direct Output Approach estimates are at least twice as large as the Labor Value Approach estimates. Having to purchase retail services to replace household production rather than hire part-time workers significantly increases the loss in household production due to an accident.

The figures in Table **3** are retail prices based on service providers available in a local market. It may be possible to acquire these services from other sources at lower prices or all services may not have to be replaced in a market.'[8] **If** so, then these figures represent an upper bound on retail prices. In addition, they represent prices to the extent that markets exist for these services. Thinner markets, especially for Obtaining Services as well as Travel for Household Activity may bias these retail prices. None-the-less, they are prices at which these services could have been purchased at the time of this survey.

The results in Table **3** are also very location specific. They represent retail prices in Lincoln, Nebraska. Regional price differences may change these results. This can be mitigated to some extent **by** using the regional multipliers in DVD. Alternatively, regional prices could be adjusted using the Bureau of Labor Statistics' *Average hours*

*and earnings of all employees on private nonfarm payrolls **by** state and metropolitan area.19*

V. Conclusion

Valuing household services has long been a forensic concern in personal injury and wrongful death cases. Typically, lost household services are valued using a Labor Value Approach; hours spent providing a variety of household services are appraised at the market wage rate for each service. This Labor Value Approach essentially approximates the cost of hiring part-time workers to perform those services as an alternative to the injured party.

Conceptually, this measure is lacking in at least one respect. Services may not be replaced **by** hiring workers to perform each service at a market wage. Rather, services may be provided **by** companies that charge retail market prices. This alternative approach that values output at retail prices is referred to as the Direct Output Approach to valuing household services.

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This paper develops a new way to value services using the Direct Output Approach. The new methodology starts with hours spent on household services, rather than the amount of output produced. This is the same starting point as the Labor Value Approach to valuing household services. **A** series is developed of hourly retail prices that consumers would pay if they were to purchase equivalent services on a retail market. Two adjustments are then made to the price series: **1)** prices for some services are adjusted downward to account for inputs no longer used in personal production of household services; and 2) the series is adjusted to account for relative productivity differences between individuals and retail service providers. The hourly activity measures are combined with the adjusted hourly retail price measures. This final measure provides an estimate of household services replaced through a retail service market.

Results using the new approach are compared to the value of household services developed using the typical Labor Value Approach. Results show that the Direct Output estimates are at least twice as large as the labor value estimates. This divergence suggests that in forensic applications, the more commonly used Labor Value Approach may produce a fairly conservative estimate of the loss related to provision of household services.

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Endnotes

1 These costs may include factors such as advertising for workers, interviewing, training, insurance, redundant workers to cover holiday and sick days, etc.
2 Other sources are cited in note **3,** infra.
3 As discussed before, the literature also suggests an opportunity cost approach, but this has not been used to a great extent in practice.
4 Sources for activity data include: **(1)** Institute for Social Research (ISR) at University of Michigan. Douglass, et. al. **(1990)** describe papers using this source. (2) Syracuse time use diary-based surveys for **1967-68** and **1977.** These data were examined **by** Walker and Gauger **(1980). (3)** South Carolina **1978** diary survey. Hunt and Kiker **(1979)** used this data set as a basis for their analysis. Studies using these first three sources are thoroughly compared in Douglass, et. al. (4) The **EPA** time use survey data. These were the source of the data used **by** Expectancy Data **(1998).** The Bureau of Labor Statistics also sponsors the American Time Use Survey. This is the source of activity data for the current Expectancy Data publication.
5 Those interested in a description of the survey methodology may refer to Expectancy Data **(2011), pp. 7-10.**
6 Fitzgerald and Wicks **(1990)** used the direct output approach to value household services produced **by** a sample of 480 households in Missoula, Montana. They first developed output categories and units of measure, such as "washing and drying - one load", and "vacuuming

- one room vacuumed once", etc. They then identified firms that performed those tasks. Average market prices were developed, typically based on a sample of six firms providing each service. The market prices were multiplied **by** the units of output to value household services. Dulaney, et. al. **(1992)** extended Fitzgerald and Wicks, breaking down results **by** sex and household status. They also generated results indicating the impact of age, number of children and other demographic/income factors on the value of household services.

7 The Ireland and Ward **(1991)** article refers to the labor value approach as the *Specific Services Replacement Cost* methodology. Douglass, et al. **(1992)** refer to it as the *Specialist-Cost approach.*

8 A description can be found at www.bls.gov/oes/

9 Expectancy Data **(2011), p.** 12.

10 For a description see Expectancy Data **(2011), p. 13.**

" NAICS industry employment data can be found at http://www.census.gov/econ/susb/

12 The Consumer Expenditure Survey can be found at http://data.bls.gov/cex and are for a four-person household.

13 This last category certainly overestimates the cost of caring for a pet.

14 It may **be** extreme to remove all expenditures on cars. However, removing car expenses biases our results downward and reduces the spread between the labor value and retail price approaches.

15 All of the costs related to an automobile are for the year 2010 and are calculated from **2009 CES** data, inflated using the **CPI.**

16 An injured person may still need a car for other purposes or to perform some household services. In this sense, removing all automobile costs probably overestimates the reduction in the value of services. **If** anything, this makes our results more conservative.

17 This probably will provide an overestimate of the cost per mile as a person would use a car to do more than just household production activities. Hence the sizable fixed costs could be spread across other uses.

18 It may be possible, for example, to have a neighborhood teenager mow the lawn at a cost lower than a mowing service.

19 www.bls.gov/sae/

Appendix A

Expanded Retail Prices for Inside Housework

ATUS Activity
020101 Interior Cleaning 020104 Storing interior hh items, inc. food
020102 Laundry **020199** Housework n.e.c.
020103 Sewing, repairing, **&** maintaining textiles

Retail Service Category	Weight	Min.($)	Max.($)	**N**	Mean($)
Maid Services	**156,688**	**30**	**86**	**9**	***$49.75***
Window Cleaners	**156,688**	40	48	**3**	$42.00

Carpet and Rug Cleaners **156,688** ***52*** **185** ***25*** **$111.82**
Curtain Cleaners **156,688 3** ***5*** 2 **$3.90**
Furniture Cleaners **156,688 90 100** 2 **$95.00**
Laundry Cleaners 175,224 **8** 22 **11 $13.91**
Tailors and Menders 41,669 **16** 44 **9** $34.94
Movers (one person-hour and **105,380 30** ***53 15*** **$38.00**
a truck)
Mean **$48.67**
Weighted Mean **$50.00**
OES Occupations Used to Value Activity at Wage Rate
Maids and housekeeping cleaners; Locker room, coat room, and dressing room attendants; Baggage Porters and bellhops; Laundry and dry-cleaning workers; Pressers, textile, garment, and related materials; Sewing machine operators; Sewers, hand

Expanded Retail Prices for Food Cooking and Cleanup

ATUS Activity
020201 Food and drink
preparation **020203** Kitchen and food clean-up
020299 Food **&** drink prep, presentation, **&**
020202 Food presentation clean-up, n.e.c
Retail Service Category Weight Min.($) Max.($) **N** Mean($)
Delivery Services **9,122 30 30 1 $30.00**
Caterers **53,320** 22 ***35*** **3 $26.67**
Maid Services 940,130 **30 86 9** ***$49.75***
Mean **$35.47**
Weighted Mean $48.34
OES Occupations Used to Value Activity at Wage Rate
Dietetic technicians; Food preparation and serving related occupations; Dishwashers
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Expanded Retail Prices for Pets, Home & Vehicles

ATUS Activity
020301 Interior arranging, decoration,
& repair 020502 Ponds, pools, and hot tubs
020302 Building & furniture repair 020599 Lawn and garden, n.e.c
020303 Heating & cooling 020681 Care for animals and pets
020399 Interior arranging, decoration, &
repair, n.e.c 020699 Pet and animal care, n.e.c.
020401 Exterior washing 020701 Vehicle repair and maintenance
020402 Exterior repair, improvements,&
decoration 020799 Vehicles, n.e.c.
020499 Exterior repair, improvements,& 020801 Appliance, tool, and toy set-up,
decoration, n.e.c repair, & maintenance
020501 Lawn, garden, and houseplant
care 020899 Appliances and tools, n.e.c.
Retail Service Category **Weight Min.($) Max.($) N Mean($)**
Screen Door Repair **11,106 72 100** 4 **$86.57**
Window Repair **11,106 53 53 1 $52.50**
Chimney Cleaners **11,106 87 100 3 $92.22**
Power Washing **11,106** 114 114 **1** $114.29
Swimming Pool Cleaning **11,106** 42 **63** ***5 $54.97***
Fertilizing Services 114,504 120 **250** ***7*** **$168.90**
Mowing Services **114,504 67 108 11 $80.36**
Snow Removal Services 114,504 **30 52 10 $38.77**
Sprinklers - Garden & Lawn 114,504 **35 63 8** $47.50
Tree Care 114,504 120 **160 6** $145.82
Animal Day Care 13,214 **1** 2 ***7*** $1.20
Animal Training 13,214 **13 15** 4 $13.74

Animal Grooming 13,214 **8 86** ***15*** **$21.69**
Animal Waste Removal 13,214 **39** ***56*** 2 $47.50
Car Washes **153,518** 120 240 **9** $84.00
General Automotive Repair 336,024 **30 80** ***15*** $48.34
Gutter and Downspout **11,106** 48 **63 3** $55.42
Cleaning
Siding Contractors 49,510 21 21 **1 $20.83**
Roofing Contractors **189,855** *45* **60** ***7*** **$51.50**
Painting Contractors **116,952** 24 ***56*** **13** $40.26
(continued on next page)
Cushing and Rosenbaum: "Valuing Household Services:
A New **Look at the Replacement Cost Approach"** ***55***

Expanded Retail Prices for Pets, Home & Vehicles (continued)

ATUS Activity
020301 Interior arranging, decoration,
& repair 020502 Ponds, pools, and hot tubs
020302 Building & furniture repair 020599 Lawn and garden, n.e.c
020303 Heating & cooling 020681 Care for animals and pets
020399 Interior arranging, decoration, &
repair, n.e.c 020699 Pet and animal care, n.e.c.
020401 Exterior washing 020701 Vehicle repair and maintenance
020402 Exterior repair, improvements,&
decoration 020799 Vehicles, n.e.c.
020499 Exterior repair, improvements,& 020801 Appliance, tool, and toy set-up,
decoration, n.e.c repair, & maintenance
020501 Lawn, garden, and houseplant
care 020899 Appliances and tools, n.e.c.
Retail Service Category **Weight Min.($) Max.($) N Mean($)**
Wall Covering Contractors **116,952 38 63 3 $46.67**
Drywall Contractors **320,238** 40 46 **8** $42.44
Mean **$61.61**
Weighted Mean **$63.29**
OES Occupations Used to Value Activity at Wage Rate
Veterinary assistants and laboratory animal caretakers; Janitors and cleaners, except maids and housekeeping cleaners; Pest control workers; Landscaping and groundskeeping workers; Nonfarm animal caretakers; Farmworkers and laborers, crop, nursery, and greenhouse; Helpers-painters, paperhangers, plasterers, and stucco masons; Electronic home entertainment equipment installers and repairers; Bicycle repairers; Tire repairers and changers; Home appliance repairers; Helpers-installation, maintenance and repair workers; Furniture finishers; Service station attendants
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Expanded Retail Prices for Household Management

ATUS Activity
020901 Financial management **080202** Using other financial services
020902 Household &personal **080203** Waiting associated w/banking /
organization and planning financial services
020903 HH **&** personal mail **&** messages **080299** Using financial services and
(except email) banking, n.e.c.*
020905 Home security **080301** Using legal services
080302 Waiting associated with legal
020999 Household management, n.e.c.* services
029999 Household activities, n.e.c.* **080399** Using legal services, n.e.c.*
080601 Activities rel. to purchasing/
080101 Using paid childcare services selling real estate
080102 Waiting associated w/purchasing **080602** Waiting associated
childcare svcs w/purchasing/selling real estate
080199 Using paid childcare services, **080699** Using real estate services,

n.e.c.* n.e.c*
080201 Banking 100102 Using social Services
Retail Service Category Weight Min.($) Max.($) **N** Mean($)
Bookkeepers 215,418 **30** ***35*** *4* **$32.33**
Tax Preparation ***215,671*** 43 **55 3 $48.67**
Paralegals **1,110,269 70 90** ***7*** **$82.86**
Mean *$54.62*
Weighted Mean **$71.01**
OES Occupations Used to Value Activity at Wage Rate
Residential advisors; Bookkeeping, accounting, and auditing clerks; Tellers; Correspondence clerks; File clerks; Order clerks; Mail clerks and mail machine operators, except postal service
Cushing and Rosenbaum: "Valuing Household Services:
A New Look at the Replacement Cost Approach" **57**

Expanded Retail Prices for Shopping

ATUS Activity
070101 Grocery Shopping **070201** Comparison shopping
070102 Purchasing gas **070299** Researching purchases, n.e.c.*
070103 Purchasing food **070301** Security procedures rel.
(not groceries) to consumer purchases
070104 Shopping, except groceries, **070399** Security procedures rel.
food and gas to consumer purchases, n.e.c.*
070105 Waiting associated with shopping **079999** Consumer purchases, n.e.c.*
160104 Telephone calls to/from
070199 Shopping, n.e.c.* salespeople
Retail Service Category Weight Min.($) Max.($) **N** Mean($)
Taxi 33,404 102 102 2 $102.00
Delivery Service 41,013 **30 30 1 $30.00**
Home Assistance **53,320** 20 24 2 $22.00
Mean **$51.33**
Weighted Mean $45.49
OES Occupations Used to Value Activity at Wage Rate
Cashiers; Counter and rental clerks; Retail salespersons; Order clerks; Couriers and messengers
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Expanded Retail Prices for Obtaining Services

ATUS Activity
090302 Waiting associated with pet
080701 Using veterinary services services
080702 Waiting associated with
veterinary services **090399** Using pet services, n.e.c.*
080799 Using veterinary services, n.e.c.* 090401 Using lawn and garden services
090402 Waiting associated with using
090101 Using interior cleaning services lawn and garden services
090499 Using lawn and garden
090102 Using meal preparation services services, n.e.c.*
090103 Using clothing repair and **090501** Using vehicle maintenance or
cleaning services repair services
090104 Waiting associated with using **090502** Waiting associated with vehicle
household services main. Or repair svcs
090599 Using vehicle maint. **&** repair
090199 Using household services, n.e.c.* sves, n.e.c.*
090201 Using home maint/repair/dicor/ **099999** Using household services,
construction svcs n.e.c.*
160105 Telephone calls to/from
090202 Waiting associated w/ home professional or personal care svcs
main/repair/d6cor/constr providers
090299 Using home maint/repair/d&cor/ **160106** Telephone calls to/from

constr services, n.e.c.* household services providers
160107 Telephone calls to/from paid
090301 Using pet services child or adult care providers
Retail Service Category Weight Min.($) Max.($) **N** Mean($)
Taxi 33,404 102 102 2 $102.00
Delivery Service 41,013 **30 30 1 $30.00**
Home Assistance **53,320** 20 24 2 $22.00
Mean **$51.33**
Weighted Mean $45.49
OES Occupations Used to Value Activity at Wage Rate
Counter and rental clerks; Order clerks; Couriers and messengers
Cushing and Rosenbaum: "Valuing Household Services:
A New Look at the Replacement Cost Approach" **59**
Expanded Retail Prices for Travel for Household Activities
ATUS Activity
180280 Travel related to housework **180901** Travel related to using
activities household services
180701 Travel related to grocery **180902** Travel related to using home
shopping main./repair/d&or./construction svcs
180782 Travel related to shopping **180903** Travel related to using pet
(except grocery shopping) services (not vet)
180802 Travel related to using financial 180904 Travel related to using lawn
services and banking and garden services
180803 Travel related to using legal **180905** Travel related to using vehicle
services maintenance **&** repair services
180806 Travel related to using real estate **180999** Travel related to using
services household services, n.e.c.*
180807 Travel related to using veterinary **181081** Travel related to using legal
services services
180899 Travel rel. to using prof. **&**
personal care services, n.e.c.*
Retail Service Category Weight Min.($) Max.($) **N** Mean($)
Delivery Service 41,013 **30 1 $30.00**
Taxi 33,404 102 102 2 $102.00
Mean **$66.00**
Weighted Mean _- **$62.32**
OES Occupations used to value Activiy at wage
Taxi drivers and chauffeurs
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