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# Replacement Cost Valuation of Production by Homemakers: Conceptual Questions and Measurement Problems

Thomas R. Ireland and John O. Ward*

## I. Introduction

Household production of goods, services and assets represents an important component of the economic value produced by all individuals, but particularly so in the case of production by homemakers. However, because of measurement difficulties, estimates of the value of household production are not included in national income figures and individual income statistics provided by the Bureau of the Census and the Labor Department of the United States Government. Regardless of that omission, economists and other social scientists have attempted to measure the value of household production, with quite mixed results (see the "Bibliography of Literature Relevant to the Valuation of Household Services" elsewhere in this journal). This article reviews the basic methodologies that have been used, particularly the commonly used replacement cost methodology, and suggests both the need for and important improvements that could be made in future studies.

There are two reasons why it is important to have accurate measures of household production. First, the omission of measures of household production from measures of national and individual income causes those figures to be very misleading as measures of the welfare of families, both in terms of urban-rural distinctions and in terms of the welfare implications of different numbers of contributing adults in a household. Since such measures are frequently utilized in forming public policy to deal with the welfare of families, it is important that inaccuracies be corrected. Second, in wrongful death, personal injury and divorce litigation, household production is often the central economic contribution of an individual whose contributions or potential contributions weigh heavily in desired legal outcomes. Economists and home economists are being called as expert witnesses in these matters and should have reliable data to work with in projecting losses and contributions of individuals.

## II. Basic Measurement Concepts

Since the values of contributions involving homemaker production are not determined in a direct market process, the valuation process must involve some kind of inductive designation of market equivalents. Four methodologies have been suggested for this purpose: 1) General Replacement Cost; 2) Specific Services Replacement Cost; 3) Current Opportunity Cost; and 4) Long Term Opportunity Cost.

The *General Replacement Cost* methodology refers to an imagined replacement cost for hiring one individual to perform all of the household services that

* University of Missouri–St. Louis and University of Missouri–Kansas City, respectively.

were being performed by a given homemaker. However, since there is no commercial market for individuals who would provide such a composite set of services, this method provides no advantages and has not been used.

The *Specific Services Replacement Cost* methodology is the most common approach, both by forensic economists and in the popular press. This approach consists of dividing the services provided by a homemaker into specific functional categories and then projecting the replacement cost for the services in each category, based on equivalents for that category in the labor market. Estimates for the amount of homemaker time spent in each category can be based on either a diary (or diary estimates) from a specific family in question or averages based on time use surveys. There are three time use surveys that have been most relied upon: The Walker-Gauger study in Ithaca, New York during the period of 1967–68 (Walker, 1969 and 1973, Walker and Woods, 1976); the time use surveys conducted by the University of Michigan's Survey Research Center in 1965–66, 1975–76 and 1975–81 (Robinson, 1977, Juster and Stafford, 1985); and the study by Hunt and Kiker in South Carolina in 1978 (Hunt and Kiker, 1979).

The *Current Opportunity Cost* methodology focuses on either (a) the amount that a full time homemaker could currently earn if employed on a full time basis in the labor market or (b) the hourly earnings available to a homemaker if employed in the labor market for the same number of hours as provided in home production. The difference between these alternatives lies in the fact that full time homemakers provide larger numbers of work hours than the 37.5 hours per week for fully employed workers. Opportunity cost measures were developed in the 1960's by the Social Security Administration, but have not been widely used by either forensic economists or other social scientists.

The basic problem that arises with this approach is that a full time homemaker has typically been out of the labor market for some time and would command only entry level compensation if she returned to the labor market. Earnings estimates based on this approach tend to be very low and misleading estimates of the value provided by homemakers who have become specialized in the occupation of homemaking. Thus, this approach ignores the long-term difference in human capital accumulation in a homemaking career, which is grossly undervalued by entry level wages available to a long-term homemaker. Many homemakers have highly developed homemaking skills because of significant human capital investments in developing those skills. If the same human capital investment had been made in labor market skills, their current earnings could be much greater than entry level wages (Becker, 1964 and 1981, Becker and Tomes, 1986).

The *Long Term Opportunity Cost* approach addresses the issue of human capital investments by homemakers by using simulated alternative labor market careers for homemakers (Ireland, 1989). With this approach, a point of decision is identified between an emphasis on a labor market career and an emphasis on a career as a homemaker. This may have been the date of marriage or the date of the birth of a first child. From that decision point, an alternative career is hypothesized, utilizing all known information about the homemaker and her husband at the point of decision. For example, if a woman had been planning to earn a masters degree in psychology prior to the point at which she decided instead to get married, emphasize her husband's career and have children, that information is utilized to project her alternative career.

If she had one year left before achieving her masters degree, it is projected that she would have entered the labor market with a masters degree in psychology one year later than the point of decision. She is then hypothesized to have acquired a number of years of experience as a woman with a masters degree in psychology equal to the number of years between her hypothesized entry and the present. Earnings for an average woman with a masters degree and the appropriate number of years of experience are then determined and used as the basis for projecting the current value of her homemaker services. A detailed discussion of the specific methodology, advantages and disadvantages of this approach are discussed by Ireland (1989).

## III. Problems with the Replacement Cost Approach

There are a number of problems inherent in the specific services replacement cost approach, which are the primary focus of this article:

1. In the non-market sector, it is very difficult to distinguish between household labor, household leisure activity and activity designed to develop or maintain household (and market) human capital.
2. There are significant differences in skill levels of homemakers that imply very important differences in the values of the services they provide. These differences are not captured by measures based on services provided by average wives in selected categories.
3. There are great difficulties in decoupling concurrently performed homemaker services. A homemaker may be providing child care, doing the laundry and preparing the evening meal all at the same time. If these services are separately valued, how is the allocation of her time handled?
4. There may be important differences in the intensity of a homemaker's performance of household tasks. In the market sector, there are employment controls on how rapidly tasks are performed. In the household, the worker and her supervisor are the same person, with the result that there may be great differences in the output per unit of time expended in household services.
5. There may be important differences in the value of household services that derive from the homemaker's stage in her work life cycle. An activity very necessary when she is younger may be performed later in life as a validation of her social role rather than in response to a true household demand for those services.
6. There are important differences in measuring the value of household activity that stem from the differences between wrongful death, personal injury and divorce litigation.

These issues will be discussed in turn:

## IV. The Economic Meaning of Household Services

Many household activities have at least reasonably close analogs in the market sector. Preparing meals, cleaning homes, child care and most other household services are also provided in the commercial marketplace. However, there are a number of conceptual problems inherent in using such simple analogies. The

production of apparently similar goods in households may have quite different meanings from the production of those apparently similar goods in the commercial sector. Suppose, for example, that a given wife spends a good deal of time maintaining a beautiful garden. It may be that gardening of this quality is actually her hobby, toward which she allocates what is in fact leisure time. If so, there is a very important qualitative difference between her gardening activity, from which she derives significant positive benefit, and the same amount of time in gardening activity that was purchased in the commercial marketplace.

In this example, her own household gardening activity has important value to the wife, separate from the value of the beautiful garden that results from her efforts. Gardening activity purchased in the commercial marketplace contains only the benefit of the beautiful garden. Another issue derives from the fact that the values attached to this gardening activity by other members of the household may be quite different from the value attached to it by the homemaker. For children, it might simply mean that they have to go further to find play area in order to avoid disturbing the garden. For the husband, it may mean a drain on the family budget to pay for plants, fertilizer and tools required for gardening as well as time demanded from him to help with heavy yard work necessitated by the garden.

In the household sector, individuals may spend time in three functional categories: 1) work activity designed to produce a flow of goods and services for which there are equal or nearly equal market equivalents; 2) leisure activity designed to provide direct psychic benefits to the individual engaging in the activity; and 3) human capital investment and maintenance activity designed to maintain and increase skills and knowledge required for either work or leisure activity. To illustrate the latter, the activity in producing a beautiful garden in the example above takes on an entirely different meaning if its intended purpose is to develop skills for future intended commercial market activity at very high wages in a publicly maintained garden facility.

In the specific services replacement cost approach, it makes a good deal of difference whether a given activity is interpreted as a leisure activity, a current production activity or a human capital investment activity or some mix of the three different categories. The nature of the difference depends on the use being made of the derived value of household services, particularly in litigation, as will be discussed below.

## V. The Problem of Decoupling Household Services

Replacement cost studies depend on the ability to assign a homemaker's time into simple categories whose replacement wage rate can be determined by finding appropriately similar market wages for the types of activity in each category. This division of a homemaker's time poses the problem of decoupling activities that are performed concurrently. A homemaker may concurrently be providing child care, doing laundry and preparing the family's evening meal during the same time period. If these three types of services are valued at different rates, the accuracy of this approach depends on the accuracy of the amounts of time assigned to each category.

However, the difficulty is not simply a matter of the division of time into

decoupled categories. Some parts of child care, for example, involves only the passive activity of being available for possible emergencies. Thus, child care is actually being provided during the actual minutes that a homemaker is folding the laundry. If the child suddenly wanted or needed her help, the homemaker could discontinue folding the laundry and attend to the child. In that sense, folding the laundry is the primary activity when valued on the basis of minutes directly involved in the activity, but is only the secondary activity in terms of the homemaker's priorities. Likewise, having a roast in the oven may require that someone is present in a supervisory capacity, but does not prevent the time spent being present from being also used for other purposes.

It is important to recognize that the labor market categories from which replacement cost proxies are derived are compensations for bundled activities. A maintenance machinist does not spend all of her time actually maintaining machines. She spends time supervising the operation of machines, doing routine maintenance, making crisis repairs, filling out reports and probably some cleaning up around the work place. Labor market compensation is often based on the skills required for the most difficult activities performed by a worker, but the worker actually spends a fair amount of time doing activities requiring less than the maximum required skills for the job. In that sense, it may not even be appropriate to try to unbundle activities performed in the household. Following this logic, it would be appropriate to use only a few categories into which time effort is assigned and to use valuation techniques based on the maximum skill requirements in each category.

## VI. Skill Levels and the Value of Household Services

Differences in skill levels between market practitioners and homemakers pose significant problems for the specific services replacement cost methodology. Virtually all mothers provide some amount of counseling to their children. In some systems of replacement cost calculations, the value of this counseling activity is very high since the replacement cost per hour of counseling in the commercial market is much higher than for other types of homemaker activities. On the other hand, counseling services provided by an untrained mother *may* not be as valuable as services provided by a professional with graduate degrees and clinical experience. On the other hand, a mother, though untrained, may have a much more thorough understanding of the background leading to a child's problem for which she is supplying counseling support. Clearly, however, there is a real problem of non-correspondence.

A closely related problem lies in the differences between homemakers themselves. A mother with a masters degree in psychology *may* have superior counseling abilities to another mother with only a high school degree. It is important to stress the "may" because evidence may exist concerning the emotional stability of the mother involved. To some extent, individuals with emotional problems take courses in psychology to try to better understand themselves, with mixed results. Thus, it may be that the mother who has a masters degree in psychology has it because of personal problems. These personal problems, in turn, may prevent her from helping a child with his (her) problems. Indeed, her problems may be the source of the child's problems. What if we have a mother with a master's degree in psychology who has been accused of past child abuse? Econ-

omists, certainly, would have no expertise in assessing the meaning of evidence that would exist in such directions.

In replacement cost studies, provision is made for the number of hours provided when there are varying numbers of children in the home and when a wife works part or full time, but no real accounting is made for any type of prior skill development in the tasks being performed. Yet, using simple educational levels as standards for making such assessments may create other problems. Would a woman with a bachelor's degree in psychology with a number of courses in nutrition evaluation produce a lower value of household services than a woman with a master's degree in mathematics? On the surface, at least, it would appear that training in psychology and nutrition would be more useful than training in mathematics for the occupation of homemaker and mother.

This means that even a time allocation study with allowance for the number of years of education for homemakers would probably fail to capture important differences in homemaker skills. When is education relevant? In the labor market, there are people with excellent degrees who cannot maintain employment because of other personal deficiencies. Households provide no monitoring of performance skills, other than through marital breakups that, in some instances, may represent the "firing" of homemakers for incompetence. Most divorces are much more complicated.

## VII. Intensity Levels and the Value of Household Services

Replacement cost studies implicitly depend on the assumption that the intensity level at which household services are performed are the same for all homemakers and for all activities being performed. The time use surveys or diary data employed in the replacement cost approach show the amounts of time being spent in various categories, but does not show the intensity with which these services are being performed. Here again, a problem arises that does not arise with market equivalents. Persons who perform tasks with high or low intensities in the labor market will tend to receive higher or lower compensation rates because of these differences in intensities. In the household, no monitoring of intensity and corresponding adjustment of compensation rates occurs, other than through altered likelihoods of divorce via spousal initiative.

The replacement cost approach shows different amounts of time spent on doing laundry by full time homemakers versus homemakers with part or full time labor market employment. But does an hour doing laundry have the same meaning to women in each of these categories? Depending on the intensity of time use, more or less laundry can be done within the same hour. Parkinson's Law that "work expands to fill the time available" is quite relevant here. Homemakers with full time jobs may be forced to work at much higher levels of intensity simply because they have less time available to perform such tasks.

However, this does not imply that a lack of intensity is a result of shirking by a homemaker who is not fully employed in the labor market. A full time homemaker may take a number of extra steps that slightly increase the quality of the laundry, such as ironing underwear and quick-pressing wash and wear garments. A homemaker with full time labor market employment is sacrificing such quality improvements in order to save time. How such marginal quality variations are to be treated is not addressed in the replacement cost approach.

## VIII. Life Cycle Effects on the Value of Household Services

The value of homemaker services may vary significantly over the homemaker's life cycle, especially in the case of full time homemakers. Full time homemakers are a minority of all homemakers and, except for among the very rich, are almost certain to be mothers as well as homemakers. Most non-rich households without children are not willing to afford the luxury of full time homemakers, given the improved living standard that can be purchased with the earnings of a second adult wage earner. In addition to direct child care for the children themselves, children significantly increase the amount of time required for food preparation, laundry, home maintenance and house cleaning. Thus, it is often less expensive for families to provide themselves with the combined package of child care and additional household services implied by children, by sacrificing outside income in favor of the services of a full time homemaker.

From the family standpoint, however, there is a significant cost in terms of sacrificed human capital that extends beyond the child rearing years. During the years in which a full time mother and homemaker has minor children in the home, she is fully employed in all senses. There is a great deal of work that needs to be done to maximize the welfare of the family. As the last child leaves the home, however, the former full time mother and homemaker may enter a period in which her economic contribution is much diminished. This period is typically referred to as the "empty nest syndrome" when reference is made to its psychological implications. Its economic implication is that she is no longer fulfilling an economic function that requires a full time homemaker.

At this point in the lives, many full time homemakers seek market employment. For many other former full time homemakers, labor market employment is only available at low wages because they lack the skills and job experience required for higher compensation. If their market oriented skills are inadequate enough, expected labor market compensation may not even cover the additional costs of clothing and transportation, especially on an after-tax basis. As a result they do not take jobs and remain officially full time homemakers, but are actually significantly underemployed individuals at this stage of their life cycles. Such significantly underemployed individuals may compensate for underemployment by increasing the amount of attention to household tasks previously performed quickly.

For example, a 49-year-old woman whose last child has left home may become a compulsive cleaner and gardener. This activity may serve to provide her with a sense of performing a worthwhile economic function, but actually provide little additional benefit to she and her husband. The important point here is that the replacement cost of the time spent in such activities by an underemployed former full time homemaker is not a true measure of the value of the benefits produced by this activity, especially if the value being determined is the value of lost household services because of a wrongful death. Since that loss is the value of the loss to the husband, the actual benefits lost are small relative to the number of hours she had been spending producing them.

Closely related to this problem is the general problem of work life expectancies for homemakers. In the labor market, retirement is a formal process and work life expectancies can be discovered through aggregate data about participation and retirement from the labor market. But household services do not have a

simple ending point in the life cycle. Full time homemakers do not receive gold watches and retire. Like old soldiers, they fade away. A 70-year-old homemaker in good physical condition is likely to be still providing a significant flow of household services. However, that flow is not likely to be as valuable as the flow of services produced by a 45-year-old. She may put in as much time, but older people do not typically do things as rapidly as younger people. This is, of course, a variation of the intensity issue discussed earlier, but now with a life cycle slant. The hours may be the same, but a 70-year-old woman, on average, has a lower intensity of time use in producing household services than a 30-year-old.

And again, specific service replacement cost studies ignore the distinctions involved in life cycle differences.

## IX. The Forensic Meaning of Household Services

Even if the distinction could be easily made between household leisure activity, household work-production activity and household human capital investment activity, there would be important differences in how these activities should be counted for different types of litigation. The valuation of household production is relevant to three types of litigation: personal injury, wrongful death and divorce actions. In each type of case, the basis for valuing household services is different.

In *personal injury litigation*, the injured party is suing for recovery of losses while still living. Assuming that she is not brain damaged to the point of a semi-vegetative state (a condition that makes personal injury similar to wrongful death), her losses should include the full value of activities she can no longer perform, regardless of whether they are leisure, production or human capital investment activities. Therefore, whether the gardening activity in the example discussed earlier is a leisure activity, a production activity or an investment activity is not a matter of legal consequence. The value of her time spent in this activity is what it was worth to her, regardless of the intended purpose.

In most *wrongful death litigation*, however, the purpose of the activity does matter. In most states, the right of survivors to recovery from wrongful death is limited to losses of the survivors, not losses of the decedent. Relying again on the gardening example, if the woman's gardening activity was her leisure rather than work-product or investment activity, its loss does not represent a loss to her survivors. It is an "hedonic" loss to her, but generates no right of recovery to survivors. Indeed, in the example as discussed, survivors are slightly better off because her gardening activity interfered with activities they enjoyed and used up family resources that are freed for other purposes by its absence. As such, if the gardening was for leisure, it is not appropriate for inclusion in a loss calculation.

If it was a work product valued by surviving family members, its loss represents a loss to survivors and should be counted, with reduction for her own enjoyment of the garden (an implicit form of personal consumption maintenance). If it was human capital investment activity, it may also represent a loss of derived future financial support to her husband, but not necessarily to the children who might have been grown and not supported by the time that the human capital investment activity began to pay dividends in the form of labor market wages to their mother.

In *divorce litigation*, the purpose of valuing homemaker services is part of an assessment of the homemaker's contributions to a marriage being dissolved. Here, if the gardening activity is adjudged to be leisure, it would represent a reduction in the value of the homemaker's contributions to the marriage. In the example, the wife used parts of the family budget to purchase fertilizer, tools and other goods in order to pursue her gardening leisure activities. This would be presented as benefits she had already received from the marriage and thus an offset to claims she would have for shares in family assets being divided. It would, in that sense, correspond to her husband's use of family resources to purchase hunting trips on which his wife was not included.

On the other hand, if it could be demonstrated that her beautiful flower garden was an important asset that her husband was able to exploit in making career contacts, it was an important contribution to family income. The third possibility that it was human capital investment activity could be presented by the husband as a form of separable human capital the wife would take with her at the end of the marriage. The husband could argue that the skills she had developed imply an increase in her future earnings potential, thus perhaps offsetting claims for alimony or maintenance.

## X. Conclusion

In this paper, we have set forth a number of conceptual problems with the replacement cost approach for valuation of the services of homemakers and home production in general. We have posed questions rather than providing answers. For some of our questions and problems, there may be no solutions. For others, we have hopefully suggested ways of thinking about problems that may suggest new methodologies for answers. As a general conclusion, we are dubious that the replacement cost approach can be improved sufficiently to resolve all of the problems we have discussed. We are, however, convinced of the importance of trying to provide valuation for homemaker services and home production in general.

The questions involved may be difficult, but the justice system must provide answers in one way or another. Economists should be able to provide the best way. No other profession can give our objectivity to the valuation of homemaker services. The effort must continue and we invite more research.

## References

All references in this paper are included in the "Bibliography of Literature Relevant to the Valuation of Household Services," published elsewhere in this journal.