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Estimating Economic Loss in the Case of a Death of a Child

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I. Introduction

Torts involving the wrongful death of a child present unique and perplexing problems for both the judicial system and the economist retained to calculate economic damages in such cases. The judicial system has dealt with the problem of damages in a variety of ways. Historically, severe limits were placed on the recovery of damages for the parents' pain and suffering on the basis that this issue was too emotionally charged. The calculation of pecuniary damages to the parents thus became critical. State courts generated widely different standards for the calculation of pecuniary damages.[1] Prior to 1960, most jurisdictions restricted recovery to lost provable earnings and services support to parents. This view of damages was appropriate where an older child in a family business or farm contributed significant economic benefits to parents or where young children were labor force participants. However, by the later half of the 20th Century such laws did not fit the reality of the roles of children in American society. In a sense, this view treated the child as a product, with economic loss equal to the probable value of the child's output to the parents beyond the date of death less the parents future expenditures in raising the child (inputs). Given the fact that the cost of raising a child could exceed the direct economic benefits the parents might expect to receive from the child in the forms of household services or earnings, a rather callous view that parents may economically benefit from a child's death prevailed.

In 1960, the Michigan Supreme Court addressed the strict pecuniary standard in the Wycko v. Gnodtke decision.[2] The Wycko court categorized the strict pecuniary loss rule as a product of the child-labor era. While conceding that damages must be based on the pecuniary value of life the court argued that the value of life also includes the value of mutual society and companionship. In addition to opening the door to parents' recovery of such non-economic interests as the lost companionship and society of a child, the court also addressed the issue of how pecuniary loss could be measured. The Wycko court held that in addition to measuring damages as the net loss of pecuniary benefits to parents, loss could also be measured as the "lost investment" of parents. Just as in the case of damage recovery for wrongful destruction of physical capital, this view holds that parents' investment in raising a child is an appropriate basis for damage recovery. The value of the child would be the parents' direct and indirect costs of raising the child less any indirect or direct monetary benefits they received from the child (outputs).

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[1] In general, American Law evolved from British Common Law ("Lord Campbell's Act," Fatal Accidents Act, 1846, 9 & 10 Vict., chapt 93) while originally covering all accidental deaths, the strict standards of pecuniary damages ultimately applied only to children while standards used in determining damages in the death of an adult were liberalized to include loss of society and companionship.

[2] See *Wycko v. Gnodtke,* 361 Mich. 331, 105 N.W. 2d 118 (1960). A general review of the evolution of loss recovery standards in the death of a child can be found in Beverly A. Myers, "Recent Developments," *Villanova Law Review,* Vol. 27, 1981-82, pp. 224-236.

Since the Wycko decision in 1960, the majority of state courts have adopted flexible standards in the recovery of damages in child death cases.[3] Thirty-six states now specifically allow parents' recovery of the lost society and companionship for a child or interpret pecuniary loss to include loss of society and companionship.

As the state courts have liberalized the recovery of damages in child death cases, they have struggled with the measurement of such damages. While society and companionship may now be considered in awarding damages in most states, many of those states still require some demonstration of pecuniary loss associated with that society and companionship. It is reasonable to expect that proof of pecuniary damages will remain the focus of most torts involving the death of a child.

The purpose of this paper is to examine the methodologies economists might use to calculate pecuniary loss to parents resulting from the death of a child. It is the paper's conclusion that the parental investment method provides the least speculative and most economically sound approach to the problem of valuation.

II. Valuation of the Life of a Child

The value of a child's life to his/her parents can be divided into two parts—intrinsic value and monetary value. Intrinsic value refers to the emotional fulfillment and "happiness" that a child brings to its parents. Such values are generally viewed as too speculative to measure. However, as the relationship between children and parents change with age, these values become more tangible. While it is difficult to consider the emotional support of a young child to parents to carry monetary value, it is easy to consider the emotional support of an adult child to an aging parent to have considerable value. Such support could consist of advice and counsel in many areas ranging from financial decisions to psychological support, and pecuniary values, or proxies for value, could be calculated for such support. Unfortunately, such support would occur as the parents reached a more advanced age. Where the child is young at the time of death establishing a foundation for such distant, future support is difficult. The same problem exists in calculating the direct monetary loss of parents. Traditionally, this direct monetary loss would consist of the direct probable financial support parents could have expected to receive from the child and the probable value of services the child could have provided to parents had the child not died. Usually, the parents expenditure in raising the child beyond its death would be subtracted from probable benefits received from the child. Again, loss is based on what could have been in the future. In the case of a child it is difficult to establish a foundation for such future events in the absence of a past record of earnings or services.

The above approach to calculating pecuniary loss can be referred to as the "product" valuation of a child's life. It focuses on the "products" of raising a child that are lost to parents through the death of the child.

A second approach to valuing the life of a child rests in treating the child as an investment by the parents. Certainly as a society we recognize this investment principle. Society invests in children through the provision of public education, public health programs and

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[3] See Lori A. Torres, "The Pecuniary Loss Rule as an Inappropriate Measure of Damages in Child Death Cases," *Indiana Law Review*, Vol. 18, 1985, pp. 731-749, for a detailed description of state laws on loss recovery in the death of a child.

transfer payments for dependent children. These investments are made with the expectation that as a result of such investments these children will be productive adults that will contribute to society. By the same reasoning parents view their children as an investment. While the direct future benefits of raising a child are unknown to the parents there nevertheless is an expectation of benefits. Such benefits might include direct financial assistance or something as basic as future companionship.

In cases where an individual's physical property is wrongfully destroyed, the individual has a right to recover the fair market value of that property. This recovery would represent the individual's investment in the property less past benefits received. In the case of physical capital, depreciation would also be subtracted from cost to determine loss, but in the case of human capital depreciation only has relevance with advanced age or job obsolescence.

The principle inputs into raising a child are the direct expenditures by parents on the child's clothing, food, health, housing and education, and the value of the parents' child care. Loss would be based on the pecuniary value of such costs less any benefits received from the child prior to its death.

A third approach to valuing the life of a child focuses on the "utility" or hedonic value of the child. Parents do not typically raise children in order to receive future services and financial benefits from those children. In our society children are viewed by parents more as consumer assets than producer assets and it is the "enjoyment" of their life that is lost to parents when a child dies. As such, pecuniary damages become irrelevant as measured through inputs or outputs of child rearing. One could examine proxies for such a utility valuation. Expenditures by prospective parents for adoptions or fertility clinics could provide some insight into the value of a baby. Kidnap ransoms or parents' medical expenditures to save a critically ill child could also serve as proxies for the value we place on a child. However, such proxies are probably irrelevant from a judicial perspective. There is no amount of award that would be compensatory to parents for the death of their child. Moreover, this approach carries the obvious bias that wealthy parents would value their children more than poorer parents because of their abilities to make such proxy expenditures.

Ultimately we are left with two basic approaches to determine pecuniary damages—the "input" approach and the "product" approach.

III. Product Valuation of the Life of a Child

Except for unusual situations where a child has established a record of earnings, services, and support to parents, a product valuation of the life of a child requires a high degree of abstraction.[4] To illustrate the procedures used in such a valuation, a hypothetical case is presented in Table 1. The case assumes a male who died on his 18th birthday. The specific assumptions of the hypothetical case and data sources are shown in the Appendix.

The financial support that a child could provide to parents is difficult to project. If the child dies at an early age, the projection becomes more abstract. Parents, friends and teachers may testify to the child's relationship with his/her parents, the child's potential earnings capacity and the child's industry in performing household services. Where the child was working or possessed marketable skills, earnings projections can be based on

[4] Such a situation might involve the death of a child movie star or an older child involved in a family business.

Table 1

		LOST EARNINGS CAPACITY AND CONTRIBUTION						
		REAL			CORRECTED FOR PROBABILITIES OF			PROBABILITY
		GROSS CENSUS	DISCOUNTED	LABOR FORCE	CHILD'S	MOTHER'S	SELF	OF STAYING
YEAR	AGE	EARNINGS	EARNINGS	PARTICIPATION	DEATH	DEATH	CONSUMPTION	HOME
1989	18	$13,907	$13,796	$10,595	$10,580	$10,567	$5,917	$5,326
1990	19	$14,138	$13,581	$10,430	$10,400	$10,371	$5,808	$5,227
1991	20	$15,283	$14,216	$10,918	$10,869	$10,821	$6,060	$2,424
1992	21	$16,521	$14,880	$11,428	$11,358	$11,287	$6,321	$2,528
1993	22	$17,859	$15,576	$11,962	$11,868	$11,770	$6,591	$2,636
1994	23	$19,305	$16,305	$12,522	$12,400	$12,271	$6,872	$2,749
1995	24	$20,869	$17,067	$13,107	$12,956	$12,790	$7,162	$2,865
1996	25	$22,559	$17,865	$13,720	$13,537	$13,328	$7,464	$970
1997	26	$24,386	$18,700	$14,362	$14,144	$13,887	$7,777	$1,011
1998	27	$26,361	$19,575	$15,034	$14,780	$14,465	$8,101	$1,053
1999	28	$28,496	$20,490	$15,737	$15,445	$15,064	$8,436	$1,097
2000	29	$29,453	$20,508	$15,750	$15,432	$14,996	$8,398	$1,092
2001	30	$30,441	$20,525	$15,763	$15,420	$14,924	$8,357	$501
2002	31	$31,463	$20,542	$15,776	$15,408	$14,847	$8,314	$499
2003	32	$32,519	$20,559	$15,789	$15,397	$14,764	$8,268	$496
2004	33	$33,611	$20,576	$15,803	$15,385	$14,675	$8,218	$493
2005	34	$35,180	$20,855	$16,017	$15,569	$14,763	$8,267	$496
2006	35	$36,823	$21,138	$16,234	$15,754	$14,843	$8,312	$332
2007	36	$38,543	$21,425	$16,454	$15,940	$14,915	$8,352	$334
2008	37	$40,343	$21,715	$16,677	$16,127	$14,977	$8,387	$335
2009	38	$42,227	$22,010	$16,903	$16,314	$15,030	$8,417	$337
2010	39	$43,406	$21,908	$16,825	$16,205	$14,800	$8,288	$332
2011	40	$44,618	$21,807	$16,748	$16,094	$14,560	$8,154	
2012	41	$45,864	$21,706	$16,670	$15,979	$14,309	$8,013	
2013	42	$47,145	$21,605	$16,593	$15,861	$14,046	$7,866	
2014	43	$48,462	$21,506	$16,516	$15,739	$13,770	$7,711	
2015	44	$49,537	$21,287	$16,348	$15,525	$13,407	$7,508	
2016	45	$50,636	$21,070	$16,182	$15,309	$13,035	$7,299	
2017	46	$51,760	$20,856	$16,017	$15,091	$12,652	$7,085	
2018	47	$52,909	$20,643	$15,854	$14,869	$12,255	$6,863	
2019	48	$54,083	$20,433	$15,693	$14,643	$11,845	$6,633	
2020	49	$54,701	$20,012	$15,370	$14,260	$11,298	$6,327	
2021	50	$55,326	$19,600	$15,053	$13,878	$10,748	$6,019	
2022	51	$55,958	$19,196	$14,743	$13,497	$10,194	$5,708	
2023	52	$56,597	$18,801	$14,439	$13,117	$9,638	$5,397	
2024	53	$57,244	$18,414	$14,142	$12,738	$9,081	$5,085	
2025	54	$58,006	$18,068	$13,876	$12,382	$8,540	$4,782	
2026	55	$58,777	$17,729	$13,615	$12,024	$7,998	$4,479	
2027	56	$59,559	$17,396	$13,360	$11,664	$7,453	$4,174	
2028	57	$60,352	$17,069	$13,109	$11,303	$6,906	$3,867	
2029	58	$61,155	$16,748	$12,863	$10,941	$6,356	$3,559	
2030	59	$61,902	$16,416	$12,608	$10,565	$5,797	$3,246	
2031	60	$62,659	$16,091	$12,358	$10,187	$5,241	$2,935	
2032	61	$63,424	$15,771	$12,112	$9,805	$4,693	$2,628	
2033	62	$64,199	$15,459	$11,872	$9,421	$4,158	$2,328	
2034	63	$64,984	$15,152	$11,637	$9,033	$3,642	$2,040	
2035	64	$64,647	$14,596	$11,210	$8,493	$3,097	$1,735	
2036	65	$64,311	$14,061	$10,799	$7,968	$2,599	$1,455	
			$895,303	$687,593	$641,675	$537,470	$300,983	$33,133

actual experience. In the case of a younger child, earnings projections can be based on Census earnings for individuals with similar characteristics. Household service projections can be based on testimony on actual services performed or studies of household services.

The example shown in Table 1 is based on Census data and household service survey data. The objective of the calculation is to demonstrate the probable discounted value of such support. Probable parental contributions to the child are partially incorporated in the child's remaining in his parent's home. As shown, the total discounted probable loss to the parents is $42,171.

Table 1 (continued)

CHILD'S HOUSEHOLD SERVICE CONTRIBUTIONS				
		CORRECT FOR PROBABILITIES		
REAL GROSS	DISCOUNTED	CHILD'S DEATH	MOTHERS DEATH	STAY HOME
$2,012	$1,996	$1,993	$1,991	$1,791
$2,045	$1,965	$1,959	$1,954	$1,758
$2,079	$1,934	$1,926	$1,917	$767
$2,114	$1,904	$1,892	$1,880	$752
$2,149	$1,874	$1,859	$1,844	$738
$2,185	$1,845	$1,827	$1,808	$723
$2,221	$1,816	$1,795	$1,772	$709
$2,258	$1,788	$1,764	$1,737	$226
$2,295	$1,760	$1,733	$1,702	$221
$2,333	$1,733	$1,703	$1,667	$217
$2,372	$1,706	$1,674	$1,633	$212
$2,411	$1,679	$1,645	$1,599	$208
$2,451	$1,653	$1,617	$1,565	$94
$2,492	$1,627	$1,589	$1,531	$92
$2,534	$1,602	$1,562	$1,498	$90
$2,576	$1,577	$1,535	$1,464	$88
$2,618	$1,552	$1,509	$1,431	$86
$2,662	$1,528	$1,483	$1,397	$56
$2,706	$1,504	$1,457	$1,363	$55
$2,751	$1,481	$1,432	$1,330	$53
$2,797	$1,458	$1,407	$1,296	$52
$2,843	$1,435	$1,382	$1,262	$50
$2,890	$1,413	$1,357	$1,228	
$2,938	$1,391	$1,333	$1,194	
$2,987	$1,369	$1,308	$1,159	
$3,037	$1,348	$1,284	$1,123	
$3,087	$1,327	$1,260	$1,088	
$3,138	$1,306	$1,235	$1,052	
$3,190	$1,285	$1,211	$1,015	
$3,243	$1,265	$1,187	$978	
$3,297	$1,246	$1,162	$940	
$3,352	$1,226	$1,138	$901	
$3,407	$1,207	$1,113	$862	
$3,464	$1,188	$1,088	$822	
$3,522	$1,170	$1,063	$781	
$3,580	$1,152	$1,037	$739	
$3,639	$1,134	$1,012	$698	
$3,700	$1,116	$985	$655	
$3,761	$1,099	$959	$613	
$3,824	$1,081	$932	$570	
$3,887	$1,065	$906	$526	
$3,952	$1,048	$878	$482	
$4,017	$1,032	$850	$438	
$4,084	$1,016	$822	$393	
$4,152	$1,000	$793	$350	
$4,221	$984	$764	$308	
$4,291	$969	$734	$268	
$4,362	$954	$704	$229	
$145,927	$67,803	$63,861	$55,054	$9,038

The simplified model of pecuniary loss used in Table 1 deals with probable loss though the assumption that if a child remains at home beyond age 17 economic support to parents would occur. In fact, parental support to the child, in most cases, would be greater than the child's contributions to parents.[5] On the other hand, the model ignores the economic contributions that adult children, with their own households would provide to parents. This would be especially important during the retirement years of parents. However, survey

[5] This issue is discussed in James N. Morgan, "Intra Family Transfers Revisited: The Support of Dependents Inside the Family," in *Five Thousand American Families of Economic Progress,* V. 6, Greg Duncan and James Morgan editors, Survey Research Center, 1978, pp. 347-365.

data suggests that such support, for the population as a whole, is minimal and the length of the discount period would make such calculations irrelevant.[6] In the above example, if the child was assumed to attend college, the net pecuniary loss to parents using the product approach would be negative. The same result would be attained in the case of the death of a very young child where the costs of raising the child would probably exceed any future pecuniary benefits received from the child.[7]

The product approach would, under normal circumstances, yield pecuniary loss estimates negatively correlated with parents' income and positively correlated with the child's age. In all cases, the product approach in valuing pecuniary damages in the death of a child yields results inconsistent with economic reality.

IV. An Investment or Input Approach to Valuing the Life of a Child

Economic reality would hold that parental valuation of the life of a child has a positive and considerable pecuniary value. While a "utility" valuation may be unacceptable to the courts, an investment valuation of the life of a child is relatively easily calculated and is soundly based in economic theory. The investment valuation approach does not specify what types of benefits parents reasonably expect to receive from raising children. It only assumes that combined pecuniary and non-pecuniary benefits exceed the costs of raising the child in the normal case. By that assumption, loss is then measured by the direct and indirect costs of raising the child less any benefits received during the life of the child. It is tempting to refer to this approach as a human capital valuation. This is not truly the case. In reality it is an indirect way of measuring pecuniary and non-pecuniary losses to the parents. No explicit assumption is made concerning the increments to the value of the child-parent relationship resulting from the parents' direct and indirect expenditures in raising the child. Ultimately, the child is also a primary agent in utilizing financial support or parental guidance in his or her development. The same concept applies to society's role in developing the child's "human capital." One can point out that society invests an average $3,970/year in a child's elementary/secondary education,[8] without suggesting that, in a particular case, society expects the child to attain a pecuniary enhancement of societal welfare of the same amount.

In a sense the objective of the expenditure on the child is similar to the concept of "goodwill" in the case of a business. It has the power to create a flow of future benefits but cannot be alienated from its objects without destruction of its value — the flow of benefits. In a sense, what is being valued is a relationship which cannot be valued in purely economic terms.

Having defined the output of raising a child as the expectation of a relationship, how adequate is the measure of the cost of raising a child in estimating the real value (outcomes) of the child to the family. The answer obviously, is that no one knows that answer, including the parents. If one could predict that their child would, as a child and as an adult,

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[6] Karen Seccombe in, "Financial Assistance from Elderly Retirement-Age Sons to their Aging Parents," *Research on Aging,* Vol. 10, 11, March, 1988, pp. 102-118, concludes that such support is infrequent.

[7] In netting out the value of benefits that could be received by parents, tax benefits of children should be considered.

[8] See Thomas Espenshade, *Investing in Children: New Estimates of Parental Expenditures,* The Urban Institute, Washington, D.C., 1984 and Bureau of the Census, U.S. Department of Commerce, *Statistical Abstract of the United States, 1989,* p. 133.

yield no financial or emotional support to them, would they rationally choose to incur the cost of raising that child? The question is not relevant to the issue at hand.

So, rather than measuring human capital investment, the input approach measures parental expectations of human capital investment. In Table 2 an example of such an investment approach to valuing the life of a child is provided. Again, the example refers to an eighteen year old male and the detail and sources of the projection are contained in the Appendix.

In the simple example in Table 2 total investment loss to parents is $218,250. No reduction is made for benefits received from the child to death.

Table 2

Value of Parental Investment in a Child

				Cost of Raising A Child	
Year	Age	Annual Value Child Care	Accumulated Values Plus Interest	Annual Expenditures	Accumulated Expenditures Plus Interest
1971	0	$1,590	$ 1,731	$1,877	$ 2,043
1972	1	1,693	3,732	2,030	4,440
1973	2	1,826	6,072	2,097	7,140
1974	3	1,406	8,180	2,197	10,213
1975	4	1,543	10,646	2,571	13,998
1976	5	758	12,503	2,848	18,469
1977	6	817	14,636	3,137	23,741
1978	7	887	17,102	3,487	29,997
1979	8	971	19,945	3,731	37,223
1980	9	1,072	23,210	4,063	45,592
1981	10	1,173	26,892	4,640	55,400
1982	11	1,264	30,887	5,093	66,361
1983	12	1,319	35,156	5,798	78,769
1984	13	1,082	39,468	6,153	92,489
1985	14	1,128	43,908	6,353	106,907
1986	15	1,176	48,542	6,564	122,174
1987	16	1,222	53,730	6,980	139,448
1988	17	1,286	59,561	7,133	158,689

Elements of loss consist of the direct costs of raising the child and the annual value of parental child care—indirect costs.

Attempts to value the indirect costs of raising a child should recognize the shortcomings of alternative measurement methods. There are four basic methods commonly used to project the indirect cost of raising a child. The indirect costs consist of the values of:

1. The direct time spent on caring for the child (nurturing, educating, feeding, etc.), and;

2. The time added to other household tasks by the presence of a child (maintenance, repairs, laundry, etc.).

The method used to measure the value of this time are:

1. The replacement method which attempts to value total hours of child care and services at a market wage/price commensurate with the skill level of the householder.
2. The market task method which values each specific task at a market replacement price, i.e., nursing care at the wage of a nurse.
3. Alternative child care method which establishes proxies for child care such as the annual cost of institutional care for a child, i.e., boarding school or a corrective facility.
4. Opportunity cost method which assumes that a unit of child care time represents an equal unit of time lost from the labor force which can be valued at a market wage rate.[9]

Each of the above methods, in a particular situation, may be inappropriate. If the skill levels of a householder are high, method 1 understates loss. If skill levels are low or average, method 2 overstates loss. Method 3 generally incorporates direct and indirect cost of raising a child but also makes no distinction between social costs of education and private costs of nurturing. For example, the average cost of maintaining a juvenile in custody in 1985 was $25,200/year in a public institution (*Statistical Abstract of the United States,* p. 174). Method 4 would place a higher value on child care provided by a highly educated or skilled individual than an individual with low employment skills. This may not reflect the reality of what is good child care. All methods would reward bad child care at the same level as good child care.

The data base used to establish the level of indirect child care costs will come directly from the householder or from a population sample. A recall of all services rendered in raising a child would be impractical for the individual although such recall could be used to modify population survey valuations of services if the individual possesses exceptional skills or devoted significantly more time to care and services than reflected by the population mean of such care and services.

The various studies of the values of household services and child care provide significant detail of such child care and services hours, by age, educational levels, employment status, size of family and age of children.[10]

The method employed in projecting the value of indirect child care services in Table 2 is an incremental method using the University of Michigan survey data (see Appendix for citation). It should be noted that these survey results provide very conservative estimates of child care services. Other studies suggest that the value of such direct and indirect child care services would be considerably higher.[11] The estimating equations in the Hunt and Kiker survey suggest a value of child care services by a wife in the Table 2 example of nearly 40 hours/week, over three times the hours used in the University of Michigan survey used in Table 2. Costs of raising a child in Table 2 are exclusive of the medical costs of

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[9] See James D. Culley et al., "Measuring the Indirect Costs of Child Care," *Public Welfare,* Fall 1976, pp. 6-13, for a detailed discussion of these methods.

[10] See, for example, Kathryn E. Walker and W.H. Gauger, "Time and Its Dollar Value in Household Work," *Family Economics Review,* Fall 1973, pp. 8-13.

[11] Such is implied by Walker and Gauger and specifically stated by Janet C. Hunt and B.F Kiker in, "Valuation of Household Services: Methodology and Estimation," *Journal of Risk and Insurance,* Vol. 46, 1979, pp. 697-705.

bearing the child and potential costs of higher education for the child. The cost of bearing the child would also include the opportunity costs of lost labor force participation of the mother during pregnancy. The inclusion of both of these costs would significantly increase the investment costs of raising the child.

As such, the investment approach to valuing the life of a child yields generally higher, less speculative, and more realistic measures of the value of the life of a child. This method of valuation does, however, incorporate specific biases. First, such loss estimates would be positively correlated with the income of parents. Second, loss estimates would also be positively correlated with the age of a child at death. The first bias may yield results that are viewed as unfortunate, but not necessarily inaccurate. In cases involving the death of an adult male for example, awards to survivors for pecuniary loss would be greater for adults with greater earnings capacity than for adults with less earnings capacity. The second bias presents a greater conceptual difficulty. It is, for example, often observed that adopting parents express a greater preference for a baby than an older child. Obviously parents place a value on benefits received from raising a young child. Such benefits would consist of the child's household services and the intrinsic value of the child-parent relationship during the child's life. Is it then necessary to reduce loss valuation by such benefits received? The question raised by this omission is whether these benefits have ex-post value in the absence of the child.

V. Conclusions

The objective of this paper was to evaluate the alternative methods available for estimating the value of the life of a child. It was the author's conclusion that a strict pecuniary product valuation of the life of a child yields negligible and irrelevant results for the economist. The utility or hedonic valuation of a child yields estimates of loss probably beyond the standards of acceptance in our judicial climate. The investment approach to valuing the life of a child has the virtue of simplicity of calculation and the virtue of economic common sense. Deficiencies in the method are recognized. Nevertheless, it provides a superior approach to pecuniary loss calculation than those product methods accepted to date.

References

Hill, C. Russell and Stafford, Frank P., "Parental Care of Children: Time Diary Estimates of Quarterly Productability, and Variety," *Journal of Human Resources,* Vol. 15, 1980.

Hunt, Janet C. and Kiker, B.B., "Valuation of Household Services: Methodology and Estimation," *Journal of Risk and Insurance,* Vol. 46, 1979.

Appendix

Source Notes and Assumptions for Tables 1 and 2

Table 1

The hypothetical case presented in Table 1 involves a white male, born in 1970 with death occurring January 1, 1989. His mother is assumed to be age 40 at his death. It is assumed that the child lived at home, had completed high school and intended to directly

enter the labor force. The earnings projection is based on Census earnings for a male, age 18, with a high school degree, and is projected to age 65 with the following adjustments.

1. Census earnings are taken from: Bureau of the Census, Department of Commerce, *Money Income of Households, Families and Persons in the United States: 1985,* Series p. 60, 1987. Earnings are adjusted, by age, for the age-earnings cycle (see Everett G. Dillman, "The Age Earnings Cycle-Earnings by Education," *Journal of Forensic Economics,* Vol. 2, No. 1, December 1988.
2. Earnings are adjusted to initial 1989 values using actual in- creases in private, non-supervisory, non-agricultural compensation for the period 1985-1989 (est.) *Economic Report of the President, (ERP)* Feb. 1989, p. 360.
3. Earnings after 1989 are increased at a real rate of 1.66%/year reflecting the average (geometric) annual rate of increase in all private, non-agricultural compensation of 6.0377% for the period 1953 to 1988 and the average non-farm price deflator of 4.3066% for the same period (*ERP,* p. 360).
4. No employer paid fringe benefits are considered in that such benefits would not accrue to parents.
5. Earnings are discounted to present value at a 3.27% real rate based on an average of the current 3 year Treasury Bond yield of 9% and the average yield on such Treasury Bonds for the period 1953-1988 of 6.43%. This nominal yield is reduced by the price deflator rate cited above (*ERP,* p. 390).
6. Future earnings are multiplied by a work force participation rate of 76.8% for males over age 20 in 1988 (*ERP,* p. 350).
7. Earnings are reduced by the child's cumulative probability of death and the mother's cumulative probability of death from age 40. It is assumed that the father has the lesser life expectancy. (Public Health Service, U.S. Department of Health and Human Services, *U.S. Decennial Life Tables for 1979-81,* Vol. II, State Life Tables, Missouri, 1986).
8. A self-consumption rate of 44% is used based on the fact that the child, remaining at home, would exclusively consume a portion of his own earnings and a portion of his parents earnings. For a family of three with a moderate income the exclusive self-consumption of one adult member would be approximately 22%. For simplicity it is assumed that parental earnings equal the child's earnings yielding a 44% self-consumption equivalent of his own earnings (calculated from: Bureau of the Census, U.S. Department of Commerce, *Statistical Abstract of the United States,* 1986).
9. Probabilities of a male child remaining at home are:

Age	Probability
15-19	90%
20-24	40
25-29	13
30-34	6
35-39	4

Beyond age 39 the probability of staying home is negligible. The possibility exists that parents may live with the child when they reach advanced age but the percentage of such cases is small. Given the time frame of discounting in this latter case, loss values would be negligible (Bureau of the Census, U.S. Department of Commerce, *Detailed Population Characteristics: U.S. Summary,* PC 80-1-D-1-A, March 1984).

10. Household service contributions of the child are taken from: William H. Gauger and Kathryn E. Walker, *The Dollar Value of Household Work,* New York State College of Human Ecology, Bulletin 60, Ithaca, NY, Cornell University, 1980. Services performed by a teen in a family of one child are adjusted to 1989 values using the worker's compensation index (*ERP*). Future values are projected in the same manner as earnings.

The above framework for the projections in Table 1 are very simplified. The issue of taxes is ignored and a constant labor force participation rate is used. While the child's household services are calculated, no attempt is made to reduce services for the child's self-consumption of services. Parental services performed for the child are not provided. If they were, the net contribution of the child would be significantly reduced. Finally, it is assumed that earnings and service transfers from the child to parents would only occur if the child remained at home. That is obviously not true. However, there is no general statistical basis for projecting such transfers.

Table 2

1. The annual costs of child care are taken from: U.S. Department of Agriculture, *USDA Estimates of the Cost of Raising a Child,* $1411, 1981. Data is specific for a male born January 1, 1971, with moderate family income. It is assumed that the parents live in the urban north central region. A family size of 4 or less is assumed. Based on these assumptions the cost of raising a child from 1971 through 1988 is shown in Table 2. Adjustments are made for family size and prices in each year (*ERP,* p. 360).

2. Since expenditures were made in the past, the parents lost the benefit of alternative uses of these funds and should recover interest lost on past investments in the child. Interest is added and compounded from 1971 through 1988 using average annual yields on three year Treasury Bonds for each respective year (*ERP,* p. 390).

3. The annual value of child care represents the direct and indirect values of child care services performed by the mother from 1971 through 1988. Data used comes from C. Russell Hill and Frank P. Stafford, "Parental Care of Children: Time Diary Estimates of Quarterly, Productability, and Variety," *Journal of Human Resources,* 15, 1980. The University of Michigan time use survey is used to estimate incremental (or decremental) time performed by a mother in direct child care (nurturing, feeding, etc.) and indirect child care (cleaning, laundry, etc.). Hours of service are specified for babies, pre-school, grade school and high school children. It is assumed that the mother has some college. Hours are valued at $5.45/hour in 1986, the average hourly earnings of maids, housemen and janitors (*Monthly Labor Review,* June 1987).

4. Values are adjusted forward to 1989 and backward to 1971 using the worker's compensation index (*ERP*).

5. Annual values are brought forward to 1989 with compound interest at the three year T-Bond rate for each year.