Good Samaritans, Rotten Parent Theorem, Old Age, and Investment in Human Capital: Some New Results

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Issues Treated in Paper

- If parents invest in human capital of children, how can children repay parents?
  Children cannot make commitments.
- How do parents get children to support them in old age when children cannot commit to this?
- What is the link between parental investment in children and children's support of elderly parents?

In this Paper ...

- Parents may try to manipulate the preferences of children to induce them to be willing to support elderly parents.
- Children "commit" to help parents through preference formation.
- This "hard-wiring" of preferences can partly solve the commitment problem, and may be Pareto-improving.
- We show this with Rotten Parent Theorem.

In this Paper ... (ctd)

- Child support creates a "Good Samaritan" problem.
- Child support most useful when parents face shocks to health and longevity.
- Social Security helps elderly, but can reduce investments in children.

Fraction of Parents Leaving Negligible Bequests

Table 1: Fraction of Decedents Leaving Negligible Bequests

Place, Time	*Percentage*
United States, late 20th century	30
11 European countries, early 21st century	23
France, late 20th century	43
France, early 20th century	70
Paris, early 19th century	90
Paris, late 19th century	81

Sources: Based on SHARE data, Hurd and Smith (2001), Piketty (2001), and Piketty et al (2004).
Notes: Entries denote the share of actual decedents who left bequests smaller than $10,000 (in 2007 USD). The eleven European countries are: Switzerland, Sweden, Denmark, Germany, Greece, France, Italy, Spain, Netherlands, Austria, and Belgium.

Fraction of Elderly Receiving a Pension

Table 2: Fraction of Elderly Population Receiving a Pension

Place	*Percentage*
World	40
North America	76
Western Europe	92
Central Eastern Europe	87
Latin America and Caribbean	50
Asia and Pacific	31
Africa	18

Sources: International Labor Office (2010)

Fraction of Elderly Receiving Support from Children

3: F E C

Country	*Percentage*	*Country*	*Percentage*
	27	C	60
D	28		65
	29		67
F	31	G	69
	31		70
	33	C ,	73
G	41		79
A	42		80
C ,	49		83
	53		83
	55		85
	57		89

Sources: B A . (1996), A . (2007), (1998), B (2002), (2000), . (2005), A

Notes: E

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Subjective Bequest Probabilities

Table 4: Subjective Bequest Probabilities by Wealth of Household

Country		*Percentage / Probability*
United States		
Wealth Decile:	1st	25
	3rd	56
	5th	73
	7th	81
	9th	83
14 European Countries		
Wealth Decile:	1st	44
	3rd	47
	5th	51
	7th	61
	9th	76

Sources: Based on SHARE data, and Hurd and Smith (2001).

Notes: For the US the entries reflect AHEAD respondents' average subjective probability of leaving a bequest exceeding 10,000 USD by decile in the wealth distrbution (Hurd and Smith 2001). In case of the European countries, entries reflect the share of respondents who expect to leave a bequest exceeding 50,000 EUR for sure. The fourteen European countries included are: Switzerland, Sweden, Denmark, Germany, Greece, France, Italy, Ireland, Poland, Czech Republic, Spain, Netherlands, Belgium and Austria.

Model

- Utility function of parents has altruism toward children:

$$V(I_p) = u(c_m) + \beta u(c_o) + \beta a U(I_c),$$

where a denotes the degree of altruism of parents. Children are not altruistic toward parents. a could be small.

- Production function for human capital of children through parental inputs

$$H = F(y, X)$$

where y measures investments in children, $F_y > 0$, $F_{yy} < 0$, and F_y is very large when y is small.

- Earnings of children when adults depend only on their human capital:

$$E = rH$$

where

$$\frac{\partial E}{\partial y} \equiv R_y = rF_y \quad \text{and} \quad \frac{\partial R_y}{\partial y} = rF_{yy} < 0$$

Model

- Budget constraints of parents at middle and old ages:

$$c_m + y + k = I_p = E_p + b_p,$$

where k denotes savings of middle aged parents, and $b_p \geq 0$ are bequests from their parents;

$$c_o + b_c = R_k k,$$

where R_k is the rate of return on k, and $b_c \geq 0$ denotes bequests to children.

- Combining budget constraints gives single lifetime budget constraint:

$$c_m + \frac{c_o}{R_k} + y + \frac{b_c}{R_k} = I_p.$$

- R_k could be low in poor countries, with badly developed capital markets.

First Order Conditions

Maximizing utility of parents subject to budget and production constraints gives FOCs.

- FOCs for parental consumption

$$u'_m = \mu \qquad \text{and} \qquad \beta u'_o = \frac{\mu}{R_k} \tag{1}$$

- FOC for investment in children

$$\beta a U'_c R_y = \mu = u'_m = \beta R_k u'_o \qquad \text{if} \quad a > 0,\ y > 0$$

- FOC for bequests (inequality since b_c may be zero)

$$\beta a U'_c \leq \frac{\mu}{R_k} \tag{2}$$

Bequests

Substituting (1) into (2), we get

$$\beta a U_c' \leq \beta u_o' \qquad \text{or} \qquad a U_c' \leq u_o' \tag{3}$$

with $<$ implying $b_c = 0$.

Clear Interpretation:

- Parents do not leave bequests if they get more marginal utility from own consumption at old age than from children's consumption.
- Parents might want old age support, but cannot force children to support them.

Bequests and Efficient Investment

Substituting (3) into FOC for y gives

$$\frac{R_y}{R_k} = \frac{u_o'}{aU_c'} \geq 1$$

with $>$ implying $R_y > R_k$ and $b_c = 0$. If $R_y = R_k$, then $b_c > 0$.

- If parents leave no bequests, then the marginal return on human capital investments is greater than the return on capital.
- Inefficient investments in human capital.

Efficient Investment and Preferences

- How to overcome inefficiency in investments when parents do not leave bequests?
- Equivalently, how to get children to support elderly parents who want support?
- One way is to manipulate the formation of child preferences so that it becomes "hard-wired" that children are willing to support their parents.
- It is costly for parents to "hard-wire". They spend z_c to affect children's preferences.

Support from Children

- By parents spending z, children are induced to give support,

Parents' Problem

Parents maximize their altruistic utility function subject to budget constraint that includes z_c:

$$\begin{aligned} V(I_p - s_p) &= u(c_m) + \beta u(c_o) + \beta a U_c(I_c - s_c) \\ s.t. \quad & c_m + \frac{c_o}{R_k} + y + z_c - \frac{s_c}{R_k} + \frac{b_c}{R_k} = I_p - s_p \end{aligned}$$

- FOCs for parental consumption no longer classical ones—come back later to this.

Solution to Parents' Problem

FOC for z_c is:

$$\beta a U_c' \frac{\partial s_c}{\partial z_c} \geq \mu\left(\tfrac{\partial s_c}{\partial z_c}/R_k - 1\right) \tag{4}$$

where $\frac{\partial s_c}{\partial z_c} \equiv R_z$, and $>$ implies $z_c = 0$.

- Necessary condition to spend z_c is $R_z > R_k$. Why?
- z_c hurts children, so must do better than k if use z_c.
- Greater incentive to manipulate preferences when capital markets are poorly developed (R_k low), i.e. in developing countries.

Alternative or Complementary Models of Child Support

- "Norm" that forces children to support parents
- How does this norm develop?
- Children support parents if parents did
- How does this emerge?

Bequests and Transfers from Children

- Parents who give bequests have no incentive to manipulate children's preferences to have children help them out when elderly.

- If $b_c > 0$, then

$$\beta a U_c' = \frac{\mu}{R_k},$$

by equation (2). So substituting into (4) gives

$$\frac{R_z}{R_k} \geq \frac{R_z}{R_k} - 1.$$

The last last inequality implies that $z_c = 0$ when $b_c > 0$.

- Richer families have less need to become "close".

Own Consumption and Transfers from Children

- Parents may spend z when marginal utility of their old age consumption exceeds the marginal utility they get from children's consumption.

- Spending on z narrows the gap in marginal utility, but never fully closes it:

$$aU_c' \frac{R_z}{R_k} = u_o' \left(\frac{R_z}{R_k} - 1\right), \tag{5}$$

  which implies $aU_c' < u_o'$.

Child Support and Human Capital Investments

For parents who do not leave bequests, FOCs imply

$$\beta a U_c' \frac{R_y}{R_k} = \frac{\mu}{R_k} > \beta a U_c',$$

or $R_y > R_k$.

- If these parents manipulate children's preferences, the gap in their marginal utility of consumption and children's marginal utility narrows.
- This implies that changing children's preferences increases investment in human capital of children.

Child Support and Market Imperfection

Using (5) and FOC for y gives

$$\frac{R_y}{R_k} = \frac{u_o'}{aU_c'}.$$

- Hence, "hard-wiring" child support may partially overcome impossibility of leaving debt to children by lowering RHS of this equation, and hence increasing investments in human capital of children.

Efficiency

- Therefore, this analysis gives an endogenous explanation of why historically, and even today in many countries, elderly parents have relied a lot on support from their children. It is often more efficient for parents to spend resources manipulating children's preferences so that they want to help out their elderly parents, than it is for parents to save much for their old age.

- Could children as well as parents be made better off when children's preferences are affected so that their utility is initially reduced?
- Possibly, since as result of child support, parents invest more in human capital of children.

Example

Suppose children are altruistic (perhaps made that way by parents), and support elderly parents. Parents are selfish.

- Will they invest in the human capital of children?
- **Rotten Parent Theorem** says they not only will invest, but they will invest optimally.

Example (ctd)

If the rate of return on human capital investments by parents, R_y, exceeds the rate of return on capital, the combined wealth of parents and their children would increase if parents invested in the human capital of children, and financed that by equal reductions in their savings for old age. Of course, that would leave parents vulnerable to having insufficient assets when they are old. However, since children would be wealthier because of the investment in their human capital, altruistic children would use some of that wealth to increase support of elderly parents. Indeed, if parental utility were a normal good to altruistic children, the increased support from children would make the parents better off, net of any spending on investing in their children's human capital.

Example (ctd)

Even selfish parents make the optimal investment in their altruistic children's human capital because in this case children have the "last word". That is, parents invest first when the children are young, and the children only later repay the parents when the children are adults and the parents are old. This is exactly analogous to the situation in the Rotten Kid Theorem, where selfish children go first with some actions that raise the income of their altruistic parents, and parents later more than compensate the children for their actions.

Testable Implication

- The model predicts that, *ceteris paribus*, parents who invested more in the human capital of their children receive more support in old age.
- Health and Retirement Study provides data on (monetary) support from children and parental investments in their children's human capital, i.e. whether parents helped finance children's college education.
- Holding parental wealth and bequest probability constant, human capital investment and old age support are positively related.

Empirical Evidence

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	2							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	( )
	-.01	-.005	.003	.013	.014	.013	.013	.013
	(.006)	(.006)	(.006)	(.006)	(.006)	(.006)	(.007)	(.007)
(100)		-.056	-.042	-.014	-.013	-.013	-.013	-.012
		(.007)	(.006)	(.005)	(.005)	(.005)	(.005)	(.005)
			.013	.015	.015	.015	.014	.014
			(.002)	(.002)	(.002)	(.002)	(.003)	(.003)
			.005	.006	.006	.006	.006	.006
			(.002)	(.001)	(.001)	(.001)	(.001)	(.001)
(100)			-.003	-.004	-.004	-.004	-.004	-.004
			(.001)	(.001)	(.001)	(.001)	(.001)	(.001)
			.05	.044	.043	.043	.045	.043
			(.01)	(.01)	(.01)	(.01)	(.017)	(.017)
			.073	.062	.061	.061	.063	.062
			(.016)	(.015)	(.015)	(.015)	(.015)	(.015)
			.043	.037	.037	.037	.037	.035
			(.02)	(.027)	(.027)	(.027)	(.027)	(.027)
			-.020	-.02	-.026	-.026	-.025	-.027
			(.010)	(.00)	(.010)	(.00)	(.00)	(.00)
			.045	.032	.032	.031	.032	.034
			(.012)	(.012)	(.012)	(.012)	(.012)	(.012)
			.034	.025	.025	.025	.025	.026
			(.007)	(.00)	(.00)	(.00)	(.00)	(.00)
			-.002	-.027	-.02	-.02	-.027	-.024
			(.034)	(.035)	(.035)	(.035)	(.035)	(.035)
				-.004	-.004	-.004	-.005	-.004
				(.003)	(.003)	(.003)	(.003)	(.003)
2				-.031	-.030	-.030	-.030	-.030
				(.013)	(.013)	(.013)	(.013)	(.013)
3				-.070	-.06	-.06	-.06	-.067
				(.013)	(.013)	(.014)	(.013)	(.013)
4				-.076	-.074	-.074	-.075	-.074
				(.013)	(.013)	(.014)	(.014)	(.014)
5				-.07	-.076	-.076	-.077	-.076
				(.013)	(.014)	(.014)	(.014)	(.014)
	.054	.075	-.156	-.163	-.165	-.17	-.164	-.167
	(.004)	(.005)	(.052)	(.050)	(.050)	(.051)	(.050)	(.04)
'								
-	.002	.014	.03	.04	.050	.050	.051	.052
	25,12	25,12	25,12	25,12	25,12	25,12	25,12	25,12

Notes:

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Life Cycle Distortions

- Children's support induces life cycle distortions.
- If support is greater when parents have fewer own assets in old age, then parents accumulate fewer assets. The FOCs are

$$u'_m = \mu \qquad \beta u'_o = \frac{\mu}{R_k}(1 - \frac{\partial s_c}{\partial c_o}) \qquad \frac{u'_m}{\beta u'_o} = \frac{R_k}{1 - \frac{\partial s_c}{\partial c_o}},$$

  with $\frac{\partial s_c}{\partial c_o} < 0$.
- Child support at old age may mainly increase parental middle age consumption.
- Parents may save little. This gives impression of poor capital markets, but endogenous to child support.
- Good Samaritan Problem.

Further Implications

- Child support may induce parents to have more children, especially if $R_z \gg R_k$. Net cost of children is lower then, especially with uncertainty.

- Value of child support increases when elderly parents face uncertainty about health, or how long they live. Children's support may be mainly insurance against bad events. Relevant rate of return:

$$E[R_z] - R_k = -R_k Cov(MRS_{mo}, R_z)$$

where R_k is the risk-free rate on savings, and MRS_{mo} denotes the marginal rate of substitution between consumption at old and middle ages.

Social Security

- Social security raises resources of elderly, lowers those of working adults
- Working adults may, as a result, invest less in their childrens' human capital

Appendix

Table A.1: Summary Statistics Health and Retirement Study

Variable	Full Sample	By Investment in Children's Human Capital: Did Not Help Finance College	Helped Finance College
Demographics:			
Female	.577	.608	.561
	(.494)	(.500)	(.490)
Age	66.175	67.309	65.607
	(10.100)	(11.198)	(9.486)
Number of Children	3.356	3.714	3.179
	(1.896)	(2.239)	(1.685)
Race:			
White	.871	.812	.901
	(.335)	(.400)	(.295)
Black	.061	.088	.047
	(.239)	(.290)	(.209)
Hispanic	.045	.070	.032
	(.207)	(.261)	(.175)
Other Race	.023	.030	.020
	(.151)	(.175)	(.138)
Marital Status:			
Single	.004	.007	.002
	(.063)	(.088)	(.047)
Cohabitating	.020	.035	.013
	(.140)	(.187)	(.111)
Married	.714	.597	.773
	(.452)	(.502)	(.414)
Divorced or Separated	.093	.119	.080
	(.291)	(.332)	(.269)
Widowed	.168	.242	.131
	(.374)	(.438)	(.334)
Health:			
Very Good	.467	.350	.526
	(.499)	(.488)	(.493)
Good	.314	.335	.304
	(.464)	(.483)	(.454)
Fair	.158	.216	.129
	(.365)	(.421)	(.332)
Poor	.060	.098	.039
	(.238)	(.305)	(.195)
Own Educational Attainment:			
Years of Schooling	12.995	11.678	13.658
	(2.797)	(2.852)	(2.527)
Drop Out	.147	.273	.083
	(.354)	(.456)	(.273)
GED	.043	.076	.027
	(.203)	(.272)	(.159)
High School	.332	.381	.307
	(.471)	(.497)	(.456)
Some College	.239	.185	.266
	(.426)	(.397)	(.436)
At Least College	.240	.085	.318
	(.427)	(.285)	(.460)
Children's Mean Educational Attainment:			
High School	.541	.694	.464
	(.367)	(.347)	(.352)
College	.384	.147	.502
	(.377)	(.275)	(.363)
Economic Indicators:			
Retired	.465	.462	.467
	(.499)	(.510)	(.493)
Total Net Worth (in $1000)	515,940	268	641
	(1,726)	(1,332)	(1,869)
Child Owns Home	.830	.813	.839
	(.376)	(.399)	(.363)
Intergeneration Transfers:			
Monetary Transfers exceeding $500:			
Received Monetary Transfer from Children during Time in Panel	.136	.174	.116
	(.342)	(.388)	(.317)
Received Monetary Transfer from Children within last 2 years	.042	.054	.036
	(.201)	(.232)	(.185)
Made Monetary Transfer to Children within last 2 years	.418	.296	.479
	(.493)	(.467)	(.494)
Probability Leave Bequest exceeding $100,000	52.900	35.314	61.541
	(42.750)	(42.847)	(39.924)
Expenditure on Children's College Education (per Child)	7,819	.000	11,740
	(13,720)	(.000)	(15,200)
Number of Observations	25,129	8,836	16,293

Notes: Entries are weighted means and standard deviations of individual level data for those individuals with non-missing information.