Online Appendix

Parental Beliefs about Returns to Different Types of Investments in School Children

Orazio Attanasio, Teodora Boneva and Christopher Rauh

Contents

A Supplementary Analysis

Table A.1: Ofsted rating of own child's school and national distribution

Ofsted rating	N	Percent	National Distribution %
Outstanding	614	31.29	21
Good	1050	53.52	68
Satisfactory/Requires Improvement	166	8.46	9
Inadequate	16	0.82	2
Don't know	116	5.91	-

Table A.2: Parental time spent with child (in minutes)

Time investment	Weekday	Weekend	Week total	SD	Min	Max	Median
Reading to/with child	16.82	17.16	118.39	158.22	0	1700	85
Talking to/with child	75.97	115.9	611.67	454.94	0	2100	500
Helping child with studies	36.54	47.17	277.03	254.01	0	2100	210
Playing with child	32.81	68.86	301.74	322.08	0	2100	220
Other educational activities	23.99	33.67	187.31	244.06	0	2100	120
Total time	186.12	282.75	1496.13	1013.45	0	5480	1285

Table A.3: Material investments per month (in pounds)

Variable	Mean	SD	Min	Max
Books (exc. school books)	14.410	26.373	0	530
Educational games	12.046	29.174	0	410
Societies	47.601	89.582	0	1200
Private Tuition	11.865	55.798	0	1200
School fees	65.901	390.213	0	4000
Total expenditure	151.600	456.181	0	5420

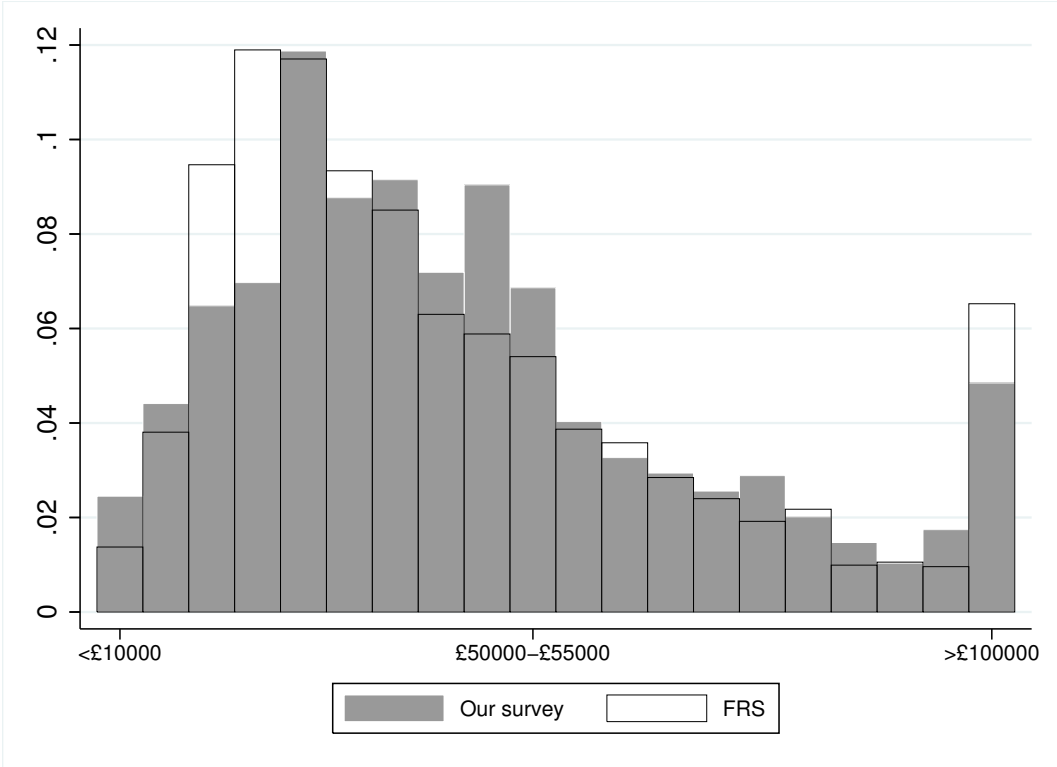Figure A.1: Distribution of household income - Comparison to Family Resources Survey

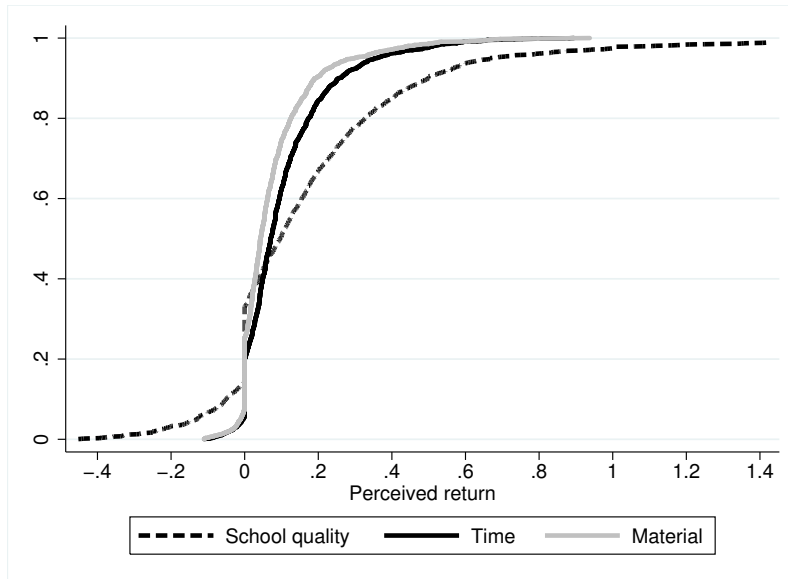Figure A.2: Distributions of individual perceived returns

Table A.4: Determinants of weekly time investments (in minutes) - Robustness

	Weekly investments						Factor
	Reading	Helping	Talking	Playing	Other	Total	Activities
Perceived returns (time)	-8.123	330.898***	55.894	62.370	253.372***	694.412**	0.782***
	(37.543)	(92.159)	(139.366)	(75.788)	(69.683)	(289.134)	(0.283)
Perceived returns (material)	146.135***	19.428	37.712	313.255***	122.743*	639.273**	0.727**
	(53.172)	(87.766)	(164.527)	(91.285)	(65.805)	(313.597)	(0.304)
Perceived returns (quality)	12.950	-5.474	46.126	-36.728	2.438	19.312	0.010
	(16.932)	(32.982)	(62.569)	(30.470)	(26.418)	(112.356)	(0.109)
Male parent	-7.252	-22.443	-97.558***	35.233*	-14.875	-106.895*	-0.081
	(8.251)	(18.130)	(32.276)	(21.275)	(13.822)	(63.841)	(0.061)
Age of parent	-0.240	-0.392	-4.280**	-3.618***	0.301	-8.229**	-0.006*
	(0.594)	(0.986)	(1.860)	(1.192)	(0.795)	(3.662)	(0.004)
Number of children	-3.357	12.486	-10.238	5.363	-4.455	-0.201	0.004
	(4.820)	(11.017)	(19.040)	(13.478)	(8.173)	(39.334)	(0.037)
Other parent in household	17.863	-15.121	-23.817	25.577	19.583	24.086	0.044
	(11.526)	(27.646)	(39.240)	(21.805)	(17.038)	(82.797)	(0.080)
Parent works full-time	-1.948	-11.210	-56.886*	-24.089	16.976	-77.156	-0.054
	(8.091)	(18.392)	(30.884)	(20.258)	(14.060)	(62.346)	(0.060)
At least one parent has degree	3.917	-15.471	-9.170	0.349	-0.420	-20.795	-0.018
	(7.937)	(15.289)	(28.259)	(19.014)	(12.194)	(58.465)	(0.056)
Own child goes to private school	12.001	39.192	-13.279	52.725	14.269	104.908	0.127
	(19.058)	(45.821)	(66.221)	(61.967)	(27.260)	(144.500)	(0.150)
2nd income quartile	-18.068*	-2.168	6.344	19.648	-2.539	3.217	-0.014
	(9.811)	(21.805)	(39.502)	(24.671)	(17.424)	(77.890)	(0.074)
3rd income quartile	-12.476	20.160	75.792**	50.577*	11.432	145.486*	0.109
	(9.632)	(22.161)	(38.030)	(26.413)	(16.008)	(78.699)	(0.075)
4th income quartile	8.655	7.087	37.828	55.602*	16.506	125.678	0.117
	(11.467)	(24.231)	(41.551)	(29.781)	(17.627)	(87.473)	(0.084)
Own child's academic ability	0.331	0.640	1.449*	0.699	1.631***	4.750***	0.005***
	(0.213)	(0.425)	(0.762)	(0.532)	(0.327)	(1.574)	(0.002)
Own child's school year	12.294**	25.983**	33.912**	13.799	25.585***	111.574***	0.115***
	(5.791)	(10.638)	(17.059)	(11.422)	(8.023)	(36.119)	(0.036)
Own child is male	0.417	-11.610	-28.526	25.883	6.774	-7.061	0.002
	(6.793)	(14.504)	(26.127)	(17.000)	(11.735)	(53.446)	(0.051)
Age of own child	-26.685***	-27.219**	-32.802*	-29.745**	-27.102***	-143.553***	-0.157***
	(5.795)	(10.904)	(17.448)	(11.803)	(8.125)	(36.954)	(0.037)
Foreign language at home	21.023	56.379**	-58.704	6.931	56.625***	82.254	0.143*
	(14.210)	(24.702)	(36.742)	(23.566)	(18.651)	(82.817)	(0.084)
Sample Mean	118.39	277.03	611.67	301.74	187.31	1496.13	0.00
R-squared	0.197	0.057	0.051	0.108	0.099	0.087	0.108
Observations	1237	1237	1237	1237	1237	1237	1237

Notes: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All regressions include a constant. Observations are weighted according to the age and gender of the parent's own child and the education level of the responding parent. The analysis is limited to those individuals for whom the implied perceived returns are non-negative. For Columns (1)-(5), the dependent variable is the number of minutes spent (in minutes) with their own child per week on the five different activities shown in the column headings, while Column (6) treats the sum across all activities as the dependent variable. 'Reading' refers to time spent per week (in minutes) during term-time reading to/with the child, while 'Talking' refers to time spent talking with or listening to the child. 'Helping' denotes time spent helping or teaching the child, and 'Playing' refers to time spent playing with him/her (including sports). 'Other' refers to all other activities related to the child's education. In the final column, the dependent variable 'Activities' is the extracted first principal component from the responses to the five activities. 'Perceived returns (time)', 'Perceived returns (material)' and 'Perceived returns (quality)' refer to the perceived returns to time investments, material investments and school quality, respectively. The regression further controls for income quartiles. 'Own child's academic ability' refers to the academic ability of the child perceived by the parent on a scale of 0-100, where a higher response reflects higher perceived ability. 'Foreign language at home' denotes whether the parent speaks any language other than English at home. 'Sample mean' gives the mean of the dependent variable.

Table A.5: Determinants of monthly material investments (in £s) - Robustness

	Monthly investments					Factor
	Books	Educ. games	Societies	Tuition	Total	Expenditure
Perceived returns (time)	3.796	6.990	21.845	14.705	-32.059	0.314
	(10.468)	(6.487)	(20.861)	(10.218)	(58.105)	(0.263)
Perceived returns (material)	60.633*	32.950***	17.719	5.338	214.139***	1.528**
	(33.650)	(12.330)	(27.019)	(10.393)	(71.818)	(0.649)
Perceived returns (quality)	3.508	1.142	7.986	-6.068*	8.602	0.067
	(3.203)	(2.742)	(9.819)	(3.315)	(23.947)	(0.098)
Male parent	-0.101	0.200	-6.175	4.058	-3.665	0.002
	(1.485)	(1.244)	(6.893)	(2.982)	(17.712)	(0.051)
Age of parent	0.022	-0.118	0.802***	-0.020	1.191	0.001
	(0.092)	(0.087)	(0.285)	(0.218)	(0.754)	(0.003)
Number of children	-0.073	-0.054	1.527	1.317	-9.373	0.010
	(1.066)	(1.696)	(3.636)	(2.639)	(10.411)	(0.048)
Other parent in household	-0.859	-2.871	1.578	1.060	-4.642	-0.043
	(1.919)	(2.568)	(5.985)	(2.317)	(14.979)	(0.076)
Parent works full-time	1.415	2.466**	1.950	2.207	9.817	0.076*
	(1.223)	(1.257)	(6.483)	(1.790)	(16.014)	(0.046)
At least one parent has degree	1.866	1.477	13.560**	6.382***	-1.204	0.132**
	(1.385)	(1.484)	(5.759)	(2.461)	(16.242)	(0.052)
Own child goes to private school	0.102	5.556	40.938	10.454	1296.217***	0.278
	(4.454)	(5.723)	(24.931)	(9.098)	(170.753)	(0.198)
2nd income quartile	-0.654	1.476	-0.568	-0.390	1.792	0.006
	(1.719)	(1.288)	(4.973)	(2.505)	(11.216)	(0.049)
3rd income quartile	3.124*	3.094**	13.091**	-4.184*	22.989	0.116**
	(1.688)	(1.489)	(6.392)	(2.157)	(14.266)	(0.054)
4th income quartile	5.657***	6.524**	29.987***	9.651**	102.724***	0.338***
	(1.935)	(2.645)	(8.943)	(4.493)	(22.862)	(0.087)
Own child's academic ability	0.114***	0.009	0.450***	-0.079	0.982***	0.003**
	(0.041)	(0.033)	(0.123)	(0.058)	(0.366)	(0.001)
Own child's school year	-0.785	1.822	2.909	0.628	4.968	0.027
	(1.587)	(1.755)	(2.920)	(1.537)	(9.850)	(0.052)
Own child is male	1.855	4.414***	-2.454	0.999	3.354	0.089*
	(1.235)	(1.351)	(5.122)	(2.075)	(12.817)	(0.046)
Age of own child	1.269	-2.228	-3.389	-0.436	-3.844	-0.025
	(1.627)	(1.695)	(2.974)	(1.531)	(10.338)	(0.050)
Foreign language at home	4.015	6.185*	2.633	7.339	14.533	0.201*
	(3.040)	(3.601)	(8.100)	(5.252)	(26.365)	(0.107)
Sample Mean	14.41	12.05	47.60	11.87	151.60	0.00
R-squared	0.115	0.076	0.080	0.049	0.522	0.116
Observations	1256	1256	1256	1256	1256	1256

Notes: Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All regressions include a constant. Observations are weighted according to the age and gender of the parent's own child and the education level of the responding parent. The analysis is limited to those individuals for whom the implied perceived returns are non-negative. For Columns (1)-(4), the dependent variable is the amount spent per month (in £s) on the respective category given by the column headings. 'Books' refers to expenditures on books other than school books, while 'Educ. games' denotes spending on educational games and toys. 'Societies' denotes monthly expenditure on sports clubs, music lessons and other societies/clubs, while 'Tuition' refers to private tuition. Column (5) treats the sum of these four expenditure categories (denoted as 'Total') as the dependent variable. In the final column, the dependent variable 'Expenditure' is the extracted first principal component from the responses to the four expenditure categories. 'Perceived returns (time)', 'Perceived returns (material)' and 'Perceived returns (quality)' refer to the perceived returns to time investments, material investments and school quality, respectively. The regression further controls for income quartiles. 'Own child's academic ability' refers to the academic ability of the child perceived by the parent on a scale of 0-100, where a higher response reflects higher perceived ability. 'Foreign language at home' denotes whether the parent speaks any language other than English at home. 'Sample mean' gives the mean of the dependent variable.

Table A.6: Determinants of school quality investments - Robustness

	School	Fees
Perceived returns (time)	-0.297*	-42.341
	(0.170)	(52.448)
Perceived returns (material)	0.165	110.842
	(0.212)	(105.067)
Perceived returns (quality)	0.075	10.933
	(0.092)	(28.239)
Male parent	0.025	6.540
	(0.045)	(22.712)
Age of parent	0.004	2.577**
	(0.003)	(1.254)
Number of children	0.009	-9.001
	(0.027)	(11.138)
Other parent in household	0.006	-5.569
	(0.058)	(18.539)
Parent works full-time	-0.090**	-15.484
	(0.045)	(22.635)
At least one parent has degree	-0.001	-9.278
	(0.039)	(20.823)
2nd income quartile	0.007	-1.688
	(0.059)	(8.356)
3rd income quartile	0.068	32.628*
	(0.052)	(17.246)
4th income quartile	0.231***	119.970***
	(0.054)	(34.485)
Own child's academic ability	0.002*	0.875**
	(0.001)	(0.353)
Own child's school year	-0.001	-9.277
	(0.023)	(9.912)
Own child is male	0.017	9.720
	(0.037)	(15.747)
Age of own child	-0.010	13.424
	(0.024)	(10.531)
Foreign language at home	0.065	-15.971
	(0.046)	(24.565)
Sample Mean	3.23	65.90
R-squared	0.056	0.057
Observations	1194	1261

Notes: Standard errors in parentheses. * $p<0.10$, ** $p<0.05$, *** $p<0.01$. Standard errors are clustered at the parent level. All regressions include a constant. Observations are weighted according to the age and gender of the parent's own child and the education level of the responding parent. The analysis is limited to those individuals for whom the implied perceived returns are non-negative. The dependent variable 'School' is a discrete variable based on the Ofsted rating of the child's school. 'School' takes value 1 if the school is rated as 'Inadequate', 2 if 'Satisfactory/Requires improvement', 3 if 'Good' and 4 if 'Outstanding'. 'Fees' refers to the amount spent per month (in £s) on school fees. 'Perceived returns (time)', 'Perceived returns (material)' and 'Perceived returns (quality)' refer to the perceived returns to time investments, material investments and school quality, respectively. The regression further controls for income quartiles. 'Own child's academic ability' refers to the academic ability of the child perceived by the parent on a scale of 0-100, where a higher response reflects higher perceived ability. 'Foreign language at home' denotes whether the parent speaks any language other than English at home. 'Sample mean' gives the mean of the dependent variable.

B   Questionnaire

B.1 Hypothetical Investment Scenarios

Next we are interested in your opinion about how important it is for parents to devote time and financial resources to help their children acquire new skills. For this purpose, we will ask you to imagine two average British families, the Jones and the Smiths, who make decisions about how much time and money to devote to their children. More specifically, we will show you different scenarios and ask you what you think the likely <u>yearly earnings</u> of the child will be at age 30. We know these questions are difficult. Please try to consider each scenario carefully and tell us what you believe the likely outcome to be.

Mr and Mrs Jones have one child, John.[1] John is in Year 3 of primary school[2], and he attends a <u>popular school, which has been rated as 'Outstanding'</u>. In the KS1 SATs John achieved the expected level.[3] During school years 3-6, Mr and Mrs Jones can decide how much time to devote to helping John acquire new skills (e.g. by reading to/with John, playing educational games, talking to John, helping John with his school work etc.) and how much money to spend on educational resources which help John acquire new skills (e.g. books, educational games, private tuition etc.). Assuming there is no inflation, what do you expect John's gross yearly earnings to be when he is 30 years old...[4]

A) if they help John for <u>0 hours every week</u> to acquire new skills, and they spend <u>£0 every week</u> on educational resources which help John to acquire new skills.

B) if they help John for <u>0 hours every week</u> to acquire new skills, and they spend <u>£30 every week</u> on educational resources which help John to acquire new skills.

C) if they help John for <u>3 hours every week</u> to acquire new skills, and they spend <u>£0 every week</u> on educational resources which help John to acquire new skills.

D) if they help John for <u>3 hours every week</u> to acquire new skills, and they spend <u>£30 every week</u> on educational resources which help John to acquire new skills.

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[1]Half of the parents in our sample were randomised into seeing a son (John) with the other half seeing a daughter (Jane).

[2]Parents were randomly selected into seeing either a child in Year 3 (primary school) or Year 7 (secondary school) in order to analyse the effect of the timing of investments.

[3]Half of the parents saw a child who achieved the expected level (high initial skill level) and half saw a child who did not (low initial skill level)

[4]Parents saw either low/high time and material investments of 0 hours/3 hours and £0/£30 respectively (Group 0) or low/high time and material investments of 1 hour/4 hours and £10/£40 respectively (Group 1).

Now imagine a different family, the Smiths. In many respects the Smiths are very similar to the Jones.[5] *For example, Mr and Mrs Smith also have one child, Simon, who is in Year 3 of primary school. They live in the same neighbourhood as Mr and Mrs Jones and they have similar levels of income and education. Also, the two children John and Simon have similar levels of intellectual ability and they both achieved the expected level in the KS1 SATs. However, there is one difference. Unlike John's school, which is popular and has been rated as 'Outstanding', Simon's school is not very popular and has only been rated as 'Requires Improvement'. Assuming there is no inflation, what do you expect Simon's gross yearly earnings to be when he is 30 years old...*

A) if they help Simon for 0 hours every week to acquire new skills, and they spend £0 every week on educational resources which help Simon to acquire new skills.

B) if they help Simon for 0 hours every week to acquire new skills, and they spend £30 every week on educational resources which help Simon to acquire new skills.

C) if they help Simon for 3 hours every week to acquire new skills, and they spend £0 every week on educational resources which help Simon to acquire new skills.

D) if they help Simon for 3 hours every week to acquire new skills, and they spend £30 every week on educational resources which help Simon to acquire new skills.

B.2 Parental Investment Questions

In the following, please think about you and your child.

How much time do you usually spend on each of the following activities during term-time? Please provide time spent in minutes on a typical weekdays and the time spend in minutes on a typical weekend day. If you don't engage in a given activity, please insert 0.

  1) Reading to/with child

  2) Talking with/listening to child

  3) Helping/teaching child

  4) Playing with child (including sports)

  5) Other activities related to child's education

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[5]The age, gender and initial skill level of the hypothetical child and the levels of low/high investments seen by parents are kept the same for the two families.

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During term-time, how much money do you on average spend (in £s) on the following categories per month for your child? If you don't spend any money in a given category, please insert 0.

1) Books (other than school books)

2) Educational games and toys

3) Sports clubs/music lessons/other societies

4) Private tuition

5) School fees