The Effect of the Cost of Children on Recent Fertility Decline in Japan
(preliminary)

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In this paper, the effect of the cost of children on fertility rate is estimated in order to verify the hypothesis that the recent fertility decline in Japan was caused by the rise of the cost of children. As cost of children, two types of measures were used. One is the cost from the Rothbarth model of equivalence scale, and the other is the monthly expenditure for children (per child). Since the cost of children itself is an endogenous variable, instrument variable estimation was made. In the estimation where the number of children is used as the dependent variable, the cost of children showed statistically significant negative effects on fertility.

Thus, as a policy implication, decreasing the cost of children is likely to affect the fertility rate positively. The examples for these policies are extension of the subsidies for education or for young children.

1. Introduction

The total fertility rate (TFR) in Japan has been declining since 1973, and it reached the very low level of 1.32 in 2003(Figure1). This level is far below the replacement rate of 2.08. This rapid decline in fertility rate caused the rapid aging of the Japanese society, making its social security system into bankrupt. Thus, it is very important to analyze why this rapid decline has occurred.

Recently the delay of childbearing of young married couples is said to account for more than half of this fertility decline (Suzuki, 2000). The high cost of children is said to be one of the causes of this delay. Table 1 shows the supporting data from the National Fertility Survey (11th, 1997) by the National Institute of Population and Social

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Security Research. According to this table, among the many married women who answered that they plan to have smaller number of children than ideal number, more than 30% chose the reasons that educating children is too costly or raising children (in general) is too costly.

Therefore, in this research, the effect that the cost of children has on the fertility is estimated, in order to examine whether the high cost of children in Japan account for the declining fertility. The cost of children takes two types in this research. The first is the expenditure for children (per child) in the month preceding the survey, and the second is the cost estimated using the equivalence scale, which is explained in another paper (Oyama 2004).

The rest of the paper is organized as follows. The next section explains the data, the section 3 shows the estimation result, and the last section concludes.

2. Data

The data used is a panel data from the Household Survey by the Institute for the Research on Household Economics. The data consists of the observations for the 7 years from 1993 to 1999. The survey started with 1500 women aged 24 to 34 (cohort A), and 500 women aged 24 to 27 are added from 1997 (cohort B). Only the data of married women from both cohorts is used in this research. The variable definition is shown in table 2, and the summary statistics of the pooled data are in table 3.

The cost of children are shown as three variables. ExpPerChild is the per child expenditure in the preceding month of the survey, CostRothA is the cost of one children estimated with Rothbarth model of equivalence scale, using the data of cohort A only. CostRothAB is the cost of one children estimated using data of both cohort A and B.

The random effect estimation results of cost of Rothbarth model using the pooled data of cohort A and B for three differently urbanized areas are shown in table 4, and we can see that cost of children is highest in the urban area, and lowest in the rural area. In estimation which follows, these numbers from the pooled regression are not used, but the estimation results for 3 areas for each of the 7 years are used as CostRothAB and CostRothA. As for the dependent variable, ChildNum is the number of children each woman has.

3. Estimation Results

Estimation results are shown in table 5a to table 6. The estimated equation is

$$NumChild = \alpha_0 + \alpha_1 CostChild + \alpha_2 WiShool + ... + u$$

In the table 5a, the dependent variable is the number of children each wife has, and the coefficient estimates of the cost variables are the main result we want to see. In this table, very simple OLS and ordered probit estimation results of this equations are shown. The three types of cost of children shows statistically significant negative effect on the number of children as expected. As for the other variables, both the wife's schooling and husband's schooling have negative effect on the number of children. Wife's full-time or part-time work have negative effect on fertility. Owing a house raise the number of children, while residing with someone other than the couple and children decreases the number of children.

In table5b, the estimation results of random effect IV and fixed effect IV models are shown. Since the cost of children are the endogenous variable, the instrument variables for their endogeneity are used. They are the share of girls among children, the dummy variables for the educational level the wife want to give to her children (good college,

college, junior(2-year) college, Professional(senmon-gakko) high school, the educational level the children themselves want), and dummy variables on the type of the school where the oldest child goes (municipal, national or private).

In table5c, same random effect IV and fixed effect IV estimation was made, but with different set of instrumental variables. Here, the instruments are the average number of children, share of girls among children, 2-year lagged type of the school where the oldest child went (municipal, national or private).

In the all three estimations, we can easily find that all three measures of the cost of children have statistically significant negative effect on the number of children. That is, if the parents spend more on each child's education, they tend to have fewer numbers of children.

Next, in table6, the estimation using prefecture-level instruments are shown. The monthly expenditure for children is the only cost of children, and the estimation was made with random effect IV and fixed effect IV. The estimation (3) (4), and (5) (6) uses different set of instrumental variables. For equation (3) and (4), the instruments are GirlShare, the educational level the wife wants the children to attain, (GoodCollege, College, JuniorCollege, Professional, HS, Self), the type of school the oldest child goes (Municipal, National Private), and other prefecture-level IVs which are kogakureki, PubDaycare, Yochien, PubHS, PubUniv and UnivShingaku. As for (5) and (6), the IVs are AvgAge, GirlShare, 2-year-lagged type of the school the oldest child goes (MunicipalL2, NationalL2, PrivateL2), kogakureki, PubDaycare, Yochien, PubHS, PubUniv, UnivShingaku. In these estimations, the expenditure for children has negative effect on fertility, again. Therefore, the hypothesis that the high cost of children decreased the fertility rate is confirmed again.

As for the other variables, the effects are similar in all estimations. If husbands are older, they tend to have more children. If wife is working fulltime (WiWorkFull) or part-time (WiWorkPart), they tend to have fewer children. It the couple owns a house, they tend to have larger number of children. Lastly, residing with family members other than the couple and children tend to decrease the number of children. This other family member can include both of the couple's parents and other relatives. Since many existing literature found that residing with couple's parents increase their number of children, estimation which distinguish the parents and other relatives will probably show more detailed results, and this is to be done in the next version of this paper.

4. Conclusion and Further Research

In this paper, the effect of the cost of children on fertility is estimated in many estimation methods and various instrumental variables. In those estimations with number of children as the dependent variable, it is shown that higher cost of children decreases the number of children. Therefore, the high cost of educating and raising children is one of the causes of the fertility decline in Japan. Therefore, policies which decreases the cost of children are likely to mitigate the decline of the fertility rate.

For further research, estimating hazard model and doing simulation of the policy effect are planned. Since the wives in the observations are relatively young, most of them are not likely to finish their birth-giving. The hazard estimation with the timing of the first birth as the dependent variable can treat this problem, since it is the stylized fact that women who gave birth in later years of her life tend to have smaller completed fertility. Also, simulating the effect of the subsidy to small children or subsidy to education will be very interesting and important.

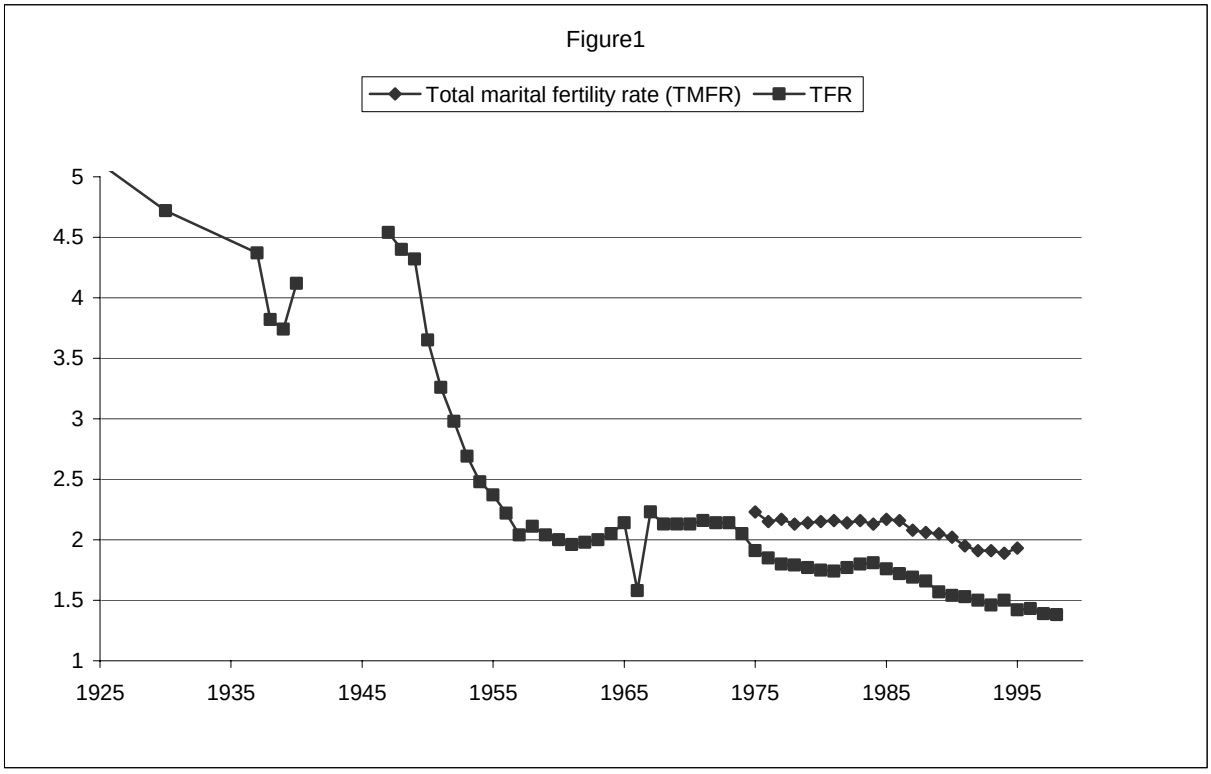
Figure1
Total marital fertility rate (TMFR)
TFR
5
4.5
4
3.5
3
2.5
2
1.5
1
1925
1935
1945
1955
1965
1975
1985
1995

Table1 : Reasons why plan to have fewer number of children than ideal, 1997							
	age <25	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**Total**
Cannot give birth (biologically)	11.1	4.4	7.1	13.0	16.7	19.7	**14.3**
Do not want to give birth at higher age	5.6	8.3	20.7	40.3	46.9	32.6	**33.6**
Educating children is too costly	55.6	49.4	46.9	33.1	30.2	22.1	**32.8**
Raining children (in general) is too costly	72.2	68.3	54.0	39.4	27.0	20.2	**35.6**
Mental and physical burden of raising children too large	22.2	17.8	32.1	24.6	18.7	13.3	**20.3**
Houses too small	27.8	23.3	21.3	13.9	9.5	7.1	**12.8**
Want to have the same# of children as others	-	1.1	0.9	0.9	1.4	1.1	**1.1**
Children interfere with wife's job	11.1	12.8	13.9	17.9	12.6	7.8	**12.5**
Children interfere with hobby or leisure	5.6	11.7	9.0	8.3	3.1	1.6	**5.4**
Want youngest child become adult before our retirement	5.6	6.1	12.3	13.2	11.3	6.0	**9.8**
other	16.7	13.3	17.6	12.5	10.3	6.6	**11.1**
missing	-	4.4	3.4	7.4	7.6	19.3	**10.1**
# of obs.	18	180	324	447	514	638	2121

Source: National Fertility Survey (1997), the National Institute of Population and Social Security Research

Table2: Definition of the variables

Variable	Definitions
id_no	ID number of the observation
House(dummy)	dummy = 1if the couple own a house
WiWorkFull(dummy)	dummy = 1 if wife works full-time
WiWoriPart(dummy)	dummy = 1 if wife works part-time
HusAge	Age of husband
WifeAge	Age of wife
OtherFami	Number of Family other than the couple and children
ExpenTotal	Monthly Total expenditure of the household
ExpenHusWi	Monthly Total expenditure for husband and wife
LnExpTotal	Log of Monthly Total expenditure of the household
LnExpHusWi	Log of Monthly Total expenditure for husband and wife
IncomeSatisf	Satisfaction with Income
ExpPerChild	Per Child Expenditure in one month before the survey
CostRothA	Cost of one children in Rothbarth model, using cohortA only
CostRothAB	Cost of one children in Rothbarth model, using both cohortA and B
WiSchool	Year of schooling of wife
HuSchool	Year of schooling of husband
Child 0-6	number of children aged 0 to 6
Child 7-13	number of children aged 7 to 13
Child 14-18	number of children aged 14 to 18
Child 0-18	number of children aged 0 to 18
ChildNum	Number of Children
Hus25(dummy)	dummy = 1 if husband is 25 to 29 years old
Hus30(dummy)	dummy = 1 if husband is 30 to 34 years old
Hus40(dummy)	dummy = 1 if husband is 40 to 44 years old
Wi25(dummy)	dummy = 1 if wife is 25 to 29 years old
Wi30(dummy)	dummy = 1 if wife is 30 to 34 years old
Wi35(dummy)	dummy = 1 if wife is 35 to 39 years old
GirlShare	Share of girls among children
GoodCollege	dummy = 1 wife wants her child to go to good college
College	dummy = 1 wife wants her child to go to college
JuniorCollege	dummy = 1 wife wants her child to go to junior college
Professional	dummy = 1 wife wants her child to go to professional school (Senmon-gakko)
HS	dummy = 1 wife wants her child to go to High School
Self	dummy = 1 wife wants her child to go to school the child him/herself wants
Municipal	dummy = 1 the oldest child goes to municipal school
National	dummy = 1 the oldest child goes to national school
Private	dummy = 1 the oldest child goes to private school
MunicipalL2	Lagged dummy = 1 the oldest child goes to municipal school 2 years ago
NationalL2	Lagged dummy = 1 the oldest child goes to national school 2 years ago
PrivateL2	Lagged dummy = 1 the oldest child goes to private school 2 years ago
PubHS	Share of public school HS student among all HS student in each prefecture
PubUniv	Share of public school college student among all college student in each prefecture
UnivShingaku	Share of student who goes to college after graduating HS in each prefecture
RelaWage	Income of newly graduates from college relative to that of HS graduates in each prefecture
kogakureki	Share of HS students who go to upper school after graduation in each prefecture
PubDaycare	Share of public daycare among all daycare in each prefecture
Yochien	Share of publlic kindergarden among all kindergardens in each prefecture
AvgAge	Average age of children
Birth94	dummy=1 if wife gave birth to a child in year 93
Birth95	dummy=1 if wife gave birth to a child in year 94
Birth96	dummy=1 if wife gave birth to a child in year 95
Birth97	dummy=1 if wife gave birth to a child in year 96
Birth98	dummy=1 if wife gave birth to a child in year 97
Birth99	dummy=1 if wife gave birth to a child in year 98

Table3:Summary Statistics of the Pooled Data

Variable	# of obs	Mean	Std.Dev.	Min	Max
id_no	7498	-	-	1	2499
House(dummy)	7462	0.604	-	0	1
WiWorkFull(dummy	7498	0.175	-	0	1
WiWoriPart(dummy	7498	0.211	-	0	1
HusAge	7498	34.941	5.397	22	60
WifeAge	7498	31.936	3.812	24	40
OtherFami	7498	0.840	1.258	0	7
ExpenTotal	7278	213.348	98.255	13	998
ExpenHusWi	7231	45.545	41.899	0	715
LnExpTotal	7278	5.264	0.457	2.565	6.906
LnExpHusWi	6168	3.763	0.682	0	6.572
IncomeSatisf	5470	2.399	0.706	1	4
ExpPerChild	6274	15.794	15.228	0	300
CostRothA	7297	1.410	0.049	0.99	1.266
CostRothAB	6683	1.440	0.053	1.007	1.289
WiSchool	7470	13.131	1.450	9	16
HuSchool	7265	13.722	2.056	9	16
Child 0-6	7498	1.016	0.868	0	4
Child 7-13	7498	0.610	0.827	0	4
Child 14-18	7498	0.064	0.292	0	3
Child 0-18	7498	1.691	0.964	0	5
ChildNum	7498	1.693	0.965	0	5
Hus25(dummy)	7498	0.155	-	0	1
Hus30(dummy)	7498	0.324	-	0	1
Hus35(dummy)	7498	0.311	-	0	1
Hus40(dummy)	7498	0.157	-	0	1
Wi25(dummy)	7498	0.286	-	0	1
Wi30(dummy)	7498	0.430	-	0	1
Wi35(dummy)	7498	0.260	-	0	1
GirlShare	6495	0.454	0.384	0	1
GoodCollege	7498	0.143	-	0	1
College	7498	0.109	-	0	1
JuniorCollege	7498	0.032	-	0	1
Professional	7498	0.030	-	0	1
HS	7498	0.127	-	0	1
Self	7498	0.554	-	0	1
Municipal	7498	0.443	-	0	1
National	7498	0.014	-	0	1
Private	7498	0.051	-	0	1
PubHS	7489	71.348	10.663	45.8	95.8
PubUniv	7489	36.761	26.116	8.1	100
UnivShingaku	7489	30.491	5.359	19.6	40.3
RelaWage	7489	1.248	0.036	1.167	1.405
kogakureki	7489	0.361	0.068	0.213	0.503
PubDaycare	7489	55.973	12.986	26.1	83.6
Yochien	7489	21.060	17.847	2.1	83
AvgAge	5974	5.588	3.397	0	17.5
Birth94	7503	0.018	-	0	1
Birth95	7503	0.018	-	0	1
Birth96	7503	0.017	-	0	1
Birth97	7503	0.018	-	0	1
Birth98	7503	0.016	-	0	1
Birth99	7503	0.014	-	0	1

*Number of observations for each year in the Panel is

1	1002	5a	980
2	1005	5b	201
3	1000	6	1163
4	1001	7	1146

Table4 Cost of children in Rothbarth model in three areas.
Dependent variable : ExpenHusWi (Expenditure for husband and wife)

	Urban 1 (13 big cities)	Urban 2 (13 big cities)	Middle1 (Other cities)	Middle2 (Other cities)	Rural 1 (Cho-son)	Rural 2 (Cho-son)
LnExpTotal	50.71 ***	50.82 ***	47.92 ***	48.17 ***	37.35 ***	37.45 ***
	(2.51)	(2.52)	(1.40)	(1.41)	(1.95)	(1.96)
Child 0-18	-8.05 ***		-6.32 ***		-3.14	
	(1.33)		(0.75)		(1.17)	
Cihld 0-6		-8.14 ***		-5.96 ***		-2.89 **
		(1.48)		(0.84)		(1.30)
Cihld 7-13		-7.10 ***		-6.33 ***		-3.35 **
		(1.73)		(0.93)		(1.42)
Child 14-18		-16.35 ***		-11.51 ***		-5.35
		(4.38)		(2.10)		(3.47)
year94	-3.52	-3.48	0.19	0.28	3.50	3.52
	(3.44)	(3.44)	(1.91)	(1.91)	(3.06)	(3.07)
year95	0.30	0.25	1.68	1.88	2.73	2.80
	(3.49)	(3.50)	(1.93)	(1.94)	(3.08)	(3.09)
year96	1.59	1.50	2.54	2.87	2.07	2.26
	(3.50)	(3.52)	(1.94)	(1.96)	(3.11)	(3.13)
year97	-1.27	-1.18	1.16	1.76	-0.73	-0.44
	(3.34)	(3.39)	(1.89)	(1.91)	(3.02)	(3.07)
year98	-4.94	-4.48	2.03	2.86	0.22	0.71
	(3.38)	(3.46)	(1.91)	(1.95)	(3.07)	(3.16)
year99	-5.54	-4.78	-0.65	0.40	2.73	3.35
	(3.43)	(3.54)	(1.93)	(2.00)	(3.13)	(3.27)
_cons	-208.68 ***	-209.45 ***	-197.91 ***	-199.69 ***	-145.45 ***	-146.24 ***
	(13.24)	(13.30)	(7.41)	(7.48)	(10.19)	(10.28)
Overall R-squared	0.25	0.26	0.27	0.27	0.28	0.28
Num. of obs.	1098	1098	2956	2956	1105	1105
Num of groups	326	326	804	804	298	298
Equivalence Scale						
Child 0-18	1.172		1.141		1.088	
Cihld 0-6		1.174		1.132		1.080
Cihld 7-13		1.150		1.140		1.094
Child 14-18		1.404		1.270		1.154

***:significant at 1% level, **: significant at 5% level (z-value in parenthesis)
*: significant at 10% level
(t-value in parenthesis)

Table5a: Area-level OLS and ordered probit estimates
Dependent variable: the number of children:

Variable	(1) OLS ExpPerChild	(2) OLS CostRothAB	(3) OLS CostRothA	(4) Oprobit ExpPerChild	(5) Oprobit CostRothAB	(6) Oprobit CostRothA
ExpPerChild	-0.01 ***			-0.02 ***		
	(0.00)			(0.00)		
CostRothAB		-1.09 ***			-1.35 ***	
		(0.22)			(0.27)	
CostRothA			-0.76 ***			-0.91 ***
			(0.20)			(0.26)
WiSchoolnew	-0.04 ***	-0.08 ***	-0.07 ***	-0.07 ***	-0.10 ***	-0.09 ***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
HuSchoolnew	-0.03 ***	-0.07 ***	-0.07 ***	-0.05 ***	-0.09 ***	-0.09 ***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Hus25	-0.38 ***	-0.50 ***	-0.57 ***	-0.62 ***	-0.63 ***	-0.71 ***
	(0.05)	(0.06)	(0.06)	(0.09)	(0.07)	(0.08)
Hus30	-0.11 **	-0.08	-0.14 **	-0.15 **	-0.11	-0.18 **
	(0.05)	(0.06)	(0.06)	(0.08)	(0.07)	(0.07)
Hus35	0.12 **	0.24 ***	0.17 ***	0.22 ***	0.28 ***	0.21 ***
	(0.05)	(0.06)	(0.06)	(0.08)	(0.07)	(0.07)
Hus40	0.27 ***	0.36 ***	0.28 ***	0.45 ***	0.44 ***	0.36 ***
	(0.05)	(0.06)	(0.06)	(0.08)	(0.07)	(0.08)
WiWorkFull	0.01	-0.34 ***	-0.32 ***	-0.04	0.42 ***	-0.39 ***
	(0.03)	(0.03)	(0.03)	(0.05)	(0.04)	(0.04)
WiWorkPart	-0.03	-0.23 ***	-0.21 ***	-0.03	-0.28 ***	-0.26 ***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.04)
House	0.13 ***	0.26 ***	0.24 ***	0.22 ***	0.31 ***	0.29 ***
	(0.02)	(0.03)	(0.03)	(0.04)	(0.03)	(0.04)
OtherFami	-0.05 ***	-0.06 ***	-0.06 ***	-0.09 ***	-0.08 ***	-0.07 ***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
_cons	3.09 ***	3.09 ***	4.58 ***			
	(0.10)	(0.10)	(0.26)			
Adjusted R2	0.12	0.18	0.17			
Num. of obs	5120	5290	5010	5120	5290	5010
Num. of group	1154	1162	1008	1154	1162	1008

(standard errors in parethesis)
***:significant at 1% level, **: significant at 5% level
*: significant at 10% level

Table5b: Area-level IV estimates
Dependent variable: the number of children:

Variable	(1) Random ExpPerChild	(2) Random CostRothAB	(3) Random CostRothA	(4) Fixed ExpPerChild	(5) Fixed CostRothAB	(6) Fixed CostRothA
ExpPerChild	-0.02 ***			-0.01 **		
	(0.01)			(0.00)		
CostRothAB		-13.46 ***			-6.80 ***	
		(2.17)			(1.42)	
CostRothA			-13.21 ***			-7.22 ***
			(3.52)			(2.44)
WiSchoolnew	-0.03	-0.04	-0.02	(dropped)	(dropped)	(dropped)
	(0.02)	(0.03)	(0.04)			
HuSchoolnew	-0.04 ***	-0.02	-0.03	-0.30 ***	-0.23 ***	-0.22 ***
	(0.01)	(0.02)	(0.03)	(0.05)	(0.07)	(0.09)
Hus25	-0.55 ***	-0.68 ***	-1.15 ***	-0.49 ***	-0.58 ***	-0.88 ***
	(0.06)	(0.09)	(0.22)	(0.06)	(0.07)	(0.17)
Hus30	-0.24 ***	-0.25 ***	-0.63 ***	-0.19 ***	-0.20 ***	-0.44 ***
	(0.06)	(0.08)	(0.16)	(0.05)	(0.06)	(0.13)
Hus35	-0.03	-0.02	-0.28 **	0.00	0.02	-0.15
	(0.05)	(0.07)	(0.13)	(0.05)	(0.06)	(0.10)
Hus40	0.10 **	0.14 **	0.01	0.10 **	0.13 ***	0.06
	(0.04)	(0.07)	(0.09)	(0.04)	(0.05)	(0.06)
WiWorkFull	0.01	-0.23 ***	-0.24 ***	-0.03	-0.15 ***	-0.15 **
	(0.04)	(0.06)	(0.09)	(0.04)	(0.05)	(0.07)
WiWorkPart	-0.01	-0.01	0.01	-0.04 *	-0.03	-0.02
	(0.02)	(0.04)	(0.04)	(0.02)	(0.03)	(0.03)
House	0.21 ***	0.12 ***	0.22 ***	0.23 ***	0.18 ***	0.24 ***
	(0.03)	(0.05)	(0.05)	(0.03)	(0.04)	(0.04)
OtherFami	-0.08 ***	-0.08 ***	-0.08 ***	-0.10 ***	-0.08 ***	-0.09 ***
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
_cons	3.19 ***	18.13 ***	18.10 ***	6.27 ***	12.94 ***	13.50 ***
	(0.21)	(2.41)	(3.93)	(0.69)	(1.65)	(2.62)
Within R2	0.04	0.00	0.00	0.03	-	-
Between R2	0.13	0.08	0.11	0.06	0.08	0.1
Overall R2	0.11	0.03	0.03	0.05	0.05	0.05
Num. of obs	5120	5290	5010	5120	5290	5010
Num. of groups	1154	1162	1008	1154	1162	1008

(standard errors in parethesis)
***:significant at 1% level, **: significant at 5% level
*: significant at 10% level

Used Intruments : GirlShare, GoodCollege, College, JuniorCollege, Professional, HS, Self, Municipal, National Private

Table5c: Area-level IV estimates
Dependent variable: the number of children:

Variable	(1) Random ExpPerChild	(2) Random CostRothAB	(3) Random CostRothA	(4) Fixed ExpPerChild	(5) Fixed CostRothAB	(6) Fixed CostRothA
ExpPerChild	-0.01 **			-0.02 ***		
	(0.01)			(0.01)		
CostRothAB		-2.68 **			-3.05 **	
		(1.09)			(1.26)	
CostRothA			-0.99 ***			-1.05 **
			(0.38)			(0.41)
WiSchoolnew	-0.04 *	-0.04	-0.05 **	(dropped)	(dropped)	(dropped)
	(0.02)	(0.03)	(0.03)			
HuSchoolnew	-0.05 ***	-0.06 ***	-0.05 ***	-0.37 ***	-0.37 ***	-0.36 ***
	(0.02)	(0.02)	(0.02)	(0.08)	(0.08)	(0.07)
Hus25	-0.45 ***	-0.47 ***	-0.49 ***	-0.47 ***	-0.47 ***	-0.48 ***
	(0.06)	(0.07)	(0.07)	(0.08)	(0.08)	(0.08)
Hus30	-0.20 ***	-0.20 ***	-0.22 ***	-0.23 ***	-0.21 ***	-0.22 ***
	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.06)
Hus35	-0.07	-0.07	-0.09 *	-0.10	-0.08	-0.09 *
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)
Hus40	-0.01	-0.02	-0.02	-0.02	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.04)
WiWorkFull	-0.01	-0.05	-0.03	-0.03	-0.06	-0.03
	(0.04)	(0.04)	(0.03)	(0.05)	(0.05)	(0.04)
WiWorkPart	-0.04 **	-0.04 **	-0.05 **	-0.04	-0.05 *	-0.05 **
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)
House	0.09 ***	0.08 ***	0.10 ***	0.09 **	0.08 **	0.10 ***
	(0.03)	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
OtherFami	-0.06 ***	-0.07 ***	-0.07 ***	-0.06 ***	-0.08 ***	-0.08 ***
	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
_cons	3.55 ***	6.62 ***	4.74 ***	7.55 ***	10.72 ***	8.39 ***
	(0.30)	(1.26)	(0.53)	(1.14)	(1.84)	(1.12)
Within R2	0.02	0.00	0.01			
Between R2	0.11	0.08	0.09	0.04	0.04	0.03
Overall R2	0.08	0.05	0.06	0.03	0.02	0.02
Num. of obs	2996	3088	3088	2996	3088	3088
Num. of groups	889	895	895	889	895	895

(standard errors in parethesis)
***:significant at 1% level, **: significant at 5% level
*: significant at 10% level

Used Intruments : AvgAge, GirlShare,MunicipalL2, NationalL2, PrivateL2

Table6: Dependent varialbe :Number of children
Prefecture-level IV estimates

	(1) Random	(2) Fixed	(3) Random	(4) Fixed
ExpPerChild	-0.03 ***	-0.01 **	-0.01 *	-0.02 ***
	(0.01)	(0.00)	(0.01)	(0.01)
WiSchoolnew	-0.02	(dropped)	-0.05 ***	(dropped)
	(0.02)		(0.02)	
HuSchoolnew	-0.04 ***	-0.30 ***	-0.04 ***	-0.37 ***
	(0.01)	(0.05)	(0.01)	(0.08)
Hus25	-0.58 ***	-0.49 ***	-0.45 ***	-0.45 ***
	(0.06)	(0.06)	(0.06)	(0.07)
Hus30	-0.27 ***	-0.19 ***	-0.20 **	-0.21 ***
	(0.06)	(0.05)	(0.05)	(0.06)
Hus35	-0.05	0.00	-0.07	-0.09
	(0.05)	(0.05)	(0.05)	(0.06)
Hus40	0.09 *	0.10 **	0.01	-0.02
	(0.05)	(0.04)	(0.04)	(0.05)
WiWorkFull	0.02	-0.03	-0.01	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)
WiWorkPart	0.00	-0.04 *	-0.05 **	-0.04 *
	(0.02)	(0.02)	(0.02)	(0.02)
House	0.21 ***	0.23 ***	0.09 ***	0.09 **
	(0.03)	(0.03)	(0.03)	(0.04)
OtherFami	-0.08 ***	-0.10 ***	-0.05 ***	-0.06 ***
	(0.01)	(0.01)	(0.01)	(0.02)
_cons	3.16 ***	6.27 ***	3.48 ***	7.49 ***
	(0.23)	(0.69)	(0.22)	(1.09)
Adjusted.R2				
Within R2	0.03	0.03	0.03	-
Between R2	0.12	0.06	0.11	0.04
Overall R2	0.10	0.05	0.08	0.02
Num. of obs	5117	5117	2994	2994
Num. of groups	1153	1153	888	888

(standard errors in parethesis)
***:significant at 1% level, **: significant at 5% level
*: significant at 10% level

Used Intruments in (3) & (4) : GirlShare, GoodCollege, College, JuniorCollege, Professional, HS, Self, Municipal, National Private, kogakureki, PubDaycare, Yochien, PubHS, PubUniv,UnivShingaku
Used Intruments in (5) & (6) : AvgAge, GirlShare, MunicipalL2, NationalL2, PrivateL2, kogakureki, PubDaycare, Yochien, PubHS, PubUniv,UnivShingaku

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