

()

가

가

가

, 10

6

(self selectivity bias)

가

가

Ben

Porath(1967)

1

1999

2,324

2002

5 3

10

.1)

2000

가 , 가가
가 .

1980
(human capital
investment theory) (learning)

(Ben Porath 1967). ,
가

가
Coleman(1984),, Michael and Tuma(1984), Light(2001)
(+) 가 .

(skill enhancing effect) 가 ,
(overestimate) .
(+) 가

(academic
performance) (drop-out) ,

(Schoenhals, Tienda, Schneider (1998)).

가 가

(socio-economic background),

(cohort) and Wise (1982) NLSY79 (cohort) (weeks per year) Ruhm (1997) NLSY79
 가 1972 (hours of work) 가 , (wage rate) Carr, Wright, and Brody (1996)
 가 , , 가 Carr, Wright, and Brody (1996)
 12 (employment level) (wage rate)
 NLSY Hotz et al. (2002) Heckman (1981) Cameron and Heckman (1999)
 (selection bias)
 (+)
 (2002) 21.1% 가
 가 , 가
 (2002) 가 30 31% , 18 22% 10%p
 (2002) 가 가 가 (ability) 가 (selection bias)가 가 가 가

가 가

가

Carr et.al (1996)

가

3).

1. 가

< 1> 3

가

가

36.5% 가

< 1>

		%		%
	419	100.0	1493	100.0
	1	0.2	9	0.6
	3	0.7	57	3.8
	153	36.5	889	59.5
	106	25.3	261	17.5
	145	34.6	265	17.8
	11	2.6	10	0.7
	0	0.0	2	0.1

: KLIPS 3

가

14.7%,

28.9%, 35.4%가
 → →
 2 가 ,
 < 2>
 6 43.4% 가 ,
 6 1 , 24 20.3% .
 2 가
 가
 가

< 2>

			%
6		182	43.4
6	12	91	21.7
12	18	46	11.0
18	24	15	3.6
24		85	20.3
		419	100.0

: KLIPS 3

3.

54.4%가
 , 4.5%가 58.9%가
 , 32.5%
 가 5.9%가 ,
 가 7.3%
 가

< 3>

	419	228	19	136	36
	(100.0)	(54.4)	(4.5)	(32.5)	(8.6)
	1493	722	66	595	110
	(100.0)	(48.4)	(4.4)	(39.8)	(7.4)

: KLIPS 3

가

가

가

가 가

가

< 4>

가

/

10

23.3%

(

+)

12.1%

11.2%

가

< 4 >

/		247	1	47	94	91	14
		(100.0)	(0.4)	(19.0)	(38.1)	(36.8)	(5.7)
		787	0	95	363	288	41
		(100.0)	(0.0)	(12.1)	(46.1)	(36.6)	(5.2)
		247	6	85	111	42	3
		(100.0)	(2.4)	(34.4)	(44.9)	(17.0)	(1.2)
		787	3	224	415	129	16
		(100.0)	(0.4)	(28.5)	(52.7)	(16.4)	(2.0)
		246	4	104	106	28	4
		(100.0)	(1.6)	(42.3)	(43.1)	(11.4)	(1.6)
		787	9	297	389	85	7
		(100.0)	(1.1)	(37.7)	(49.4)	(10.8)	(0.9)
		246	2	92	114	32	6
		(100.0)	(0.8)	(37.4)	(46.3)	(13.0)	(2.4)
		787	6	245	386	136	14
		(100.0)	(0.8)	(31.1)	(49.0)	(17.3)	(1.8)
		246	3	75	98	60	10
		(100.0)	(1.2)	(30.5)	(39.8)	(24.4)	(4.1)
		787	1	216	363	187	20
		(100.0)	(0.1)	(27.4)	(46.1)	(23.8)	(2.5)
가		246	5	68	108	56	9
		(100.0)	(2.0)	(27.6)	(43.9)	(22.8)	(3.7)
		786	7	206	412	143	18
		(100.0)	(0.9)	(26.2)	(52.4)	(18.2)	(2.3)
		245	7	108	111	17	2
		(100.0)	(2.9)	(44.1)	(45.3)	(6.9)	(0.8)
		787	12	300	435	36	4
		(100.0)	(1.5)	(38.1)	(55.3)	(4.6)	(0.5)
		222	1	50	143	21	7
		(100.0)	(0.5)	(22.5)	(64.4)	(9.5)	(0.3)
		714	2	147	458	97	10
		(100.0)	(0.3)	(20.6)	(64.1)	(13.6)	(1.4)
		223	2	44	113	53	11
		(100.0)	(0.9)	(19.7)	(50.7)	(23.8)	(4.9)
		715	1	116	407	157	34
		(100.0)	(0.1)	(16.2)	(56.9)	(22.0)	(4.8)
		246	2	77	128	35	4
		(100.0)	(0.8)	(31.3)	(52.0)	(14.2)	(1.6)
		786	1	196	474	109	6
		(100.0)	(0.1)	(24.9)	(60.3)	(13.9)	(0.8)

1. 가

가

가

가

$$(1a) \quad A = A(Z, Q, t_w)$$

$$A_1 > 0, A_2 < 0, A_3 < 0$$

$$(1b) \quad \mathcal{E} = \mathcal{E}(Z, A, Q, t_w)$$

$$\mathcal{E}_1 > 0, \mathcal{E}_2 > 0, \mathcal{E}_3 > 0, \mathcal{E}_4 > 0$$

$$(1c) \quad t_w = t_w(X_1)$$

$$(1d) \quad Q = Q(X_1)$$

t_w

, Q

(quality)

, A

, WP

, Z

, X_1

가

(1a)

(academic achievement production function)

, 가

(1b)

(expected postschool earnings

equation)

(1a)

,

(2)

(+)

(1)

(1a)

(1b)

(-)

가

(1c) (1d)가

가

$$(2) \quad \Pr(t_w > 0) = a_0 + a_1 A + a_2 Q + a_3 Z + a_4 \mathcal{E} + a_5 X_1 + \mu$$

2.

< 5 >

	s work		1713	0.21	0.41
	gender		2949	0.46	0.50
	dmarr		2949	0.12	0.32
	age		2890	22.36	4.15
	agesq		2890	517.11	186.9
	edu1		2949	0.03	0.16
	edu2		2949	0.51	0.50
	edu3		2949	0.15	0.36
	edu4		2949	0.30	0.46
	major1		2949	0.10	0.30
	major2		2949	0.05	0.22
	major3		2949	0.06	0.23
	major4		2949	0.11	0.32
	major5		2949	0.13	0.33
	d1grow14	14 ()	2949	0.20	0.40
	d2grow14	14 ()	2949	0.27	0.44
	d3grow14	14 ()	2949	0.53	0.50
	d1score	(20%)	2949	0.01	0.07
	d2score	(20% - 40%)	2949	0.01	0.10
	d3score	(40% - 60%)	2949	0.01	0.11
	d4score	(20% - 40%)	2949	0.01	0.12
	d5score	(20%)	2949	0.02	0.14
가	nfamil	가	2949	4.10	1.23
	fincome	가	2949	180.80	110.77
	fedu1	()	2949	0.42	0.49
	fedu2	()	2949	0.30	0.46
	fedu3	()	2949	0.29	0.45
	medu1	()	2949	0.26	0.44
	medu2	()	2949	0.24	0.43
	medu3	()	2949	0.50	0.50
	sclass1	()	2949	0.01	0.03
	sclass2	()	2949	0.03	0.16
	sclass3	()	2949	0.37	0.48
	sclass4	()	2949	0.43	0.49
	sclass5	()	2949	0.17	0.38

< 5> . (2)
 가 가 .
 (gender), (dmarr), (age), (edu1 edu4),
 (major 1 major5), 14 (d1grow1 d1grow3) ,
 1997
 4).
 가 (fedu1 fedu3) (medu1 medu3),
 가 2000 가 ,
 가
 . KLIPS 가 가
 (bias) 가 가
 가 가 ,
 가 가

1. 가

< 6> (2) . (1) (2)

가 , , ,
 가 , 가 ,
 가 ,
 가 가 가
 가 가

< 6>

가

	(1)	(2)
gender	- 0.17(0.08)**	- 0.17(0.08)**
dmarr	0.09(0.12)	0.12(0.12)
age	0.32(0.18)*	0.29(0.18)*
agesq	- 0.01(0.00)*	- 0.01(0.00)*
major2	0.79(0.15)***	
major3	0.02(0.17)	
major4	0.56(0.11)***	
major5	0.42(0.11)***	
edu3*major2		0.81(0.20)***
edu3*major3		- 0.39(0.30)
edu3*major4		0.64(0.14)***
edu3*major5		0.67(0.15)***
edu4*major1		0.50(0.16)***
edu4*major2		0.94(0.21)***
edu4*major3		0.40(0.21)*
edu4*major4		0.64(0.17)***
edu4*major5		0.38(0.15)**
sclass2	4.70(2.08)**	4.65(2.10)**
sclass3	4.25(2.07)**	4.19(2.08)**
sclass4	4.22(2.06)**	4.16(2.08)**
sclass5	4.01(2.06)*	3.98(2.08)*
fedu2	- 0.09(0.09)	- 0.11(0.09)
fedu3	- 0.02(0.10)	- 0.04(0.10)
medu2	0.08(0.11)	0.09(0.11)
medu3	- 0.01(0.09)	- 0.00(0.09)
d1grow14	- 0.12(0.10)	- 0.12(0.10)
d2grow14	- 0.04(0.08)	- 0.04(0.09)
d2score	0.55(0.23)**	0.34(0.25)
d3score	0.66(0.22)***	0.53(0.23)**
d4score	0.21(0.21)	0.05(0.22)
d5score	0.40(0.18)**	0.26(0.20)
constant	- 8.81(.)	- 8.41(.)
Pseudo R2	0.07	0.08
obs	1713	1713

: *** 0.01, ** 0.05, * 0.1

2.

가 가
 가 .
 .
 (self selectivity) (bias) .
 , 가
 5).
 (self selectivity bias) 2
 (Two stage least square estimation) . 2
 가
 , < 7> 가 가
 ,

< 7>

2SLS

/	- 1.70	0.49	***
	- 0.73	0.37	**
	- 0.70	0.38	*
	- 1.17	0.43	***
	- 0.24	0.40	
가	- 0.12	0.41	
	- 1.04	0.39	***
	- 0.17	0.55	
	- 0.52	0.55	
	- 0.89	0.44	**

: *** 0.01, ** 0.05, * 0.1

10

가

10% 가 , 6 .
가 1% 가
가 5%
가 10% 가

가 가 ,

가

가 가 .

가

(+)

, KLIPS 가 , 가
가 (measurement error)가

KLIPS

, KLIPS 3

15

29

3,302

419

가

가

가

가

가

KLIPS

가

가

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: 83- 108

, 2002, "
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< >

1. : /

swork	- 1.70	0.49	***
edu1	1.26	1.16	
edu3	0.27	0.15	*
edu4	0.31	0.17	*
dmarr	0.09	0.11	
age	0.17	0.17	
agesq	-0.00	0.00	
gender	0.10	0.08	
_cons	0.92	2.05	

: 1001

: *** 0.01, ** 0.05, * 0.1

2. :

swork	- 0.73	0.37	**
edu1	0.82	0.88	
edu3	0.02	0.11	
edu4	-0.00	0.13	
dmarr	0.07	0.09	
age	0.05	0.13	
agesq	-0.00	0.00	
gender	0.19	0.06	***
_cons	1.52	1.56	

: 1001

: *** 0.01, ** 0.05, * 0.1

3. :

swork	-0.70	0.38	*
edu1	0.85	0.91	
edu3	0.13	0.12	
edu4	0.02	0.14	
dmarr	0.20	0.09	**
age	-0.06	0.13	
agesq	0.00	0.00	
gender	0.18	0.06	***
_cons	2.81	1.61	*

: 1001
: *** 0.01, ** 0.05, * 0.1 .

4. :

swork	-1.17	0.43	***
edu1	0.64	1.02	
edu3	0.16	0.13	
edu4	0.07	0.15	
dmarr	0.16	0.10	
age	-0.14	0.15	
agesq	0.00	0.00	
gender	0.28	0.07	***
_cons	3.95	1.80	**

: 1001
: *** 0.01, ** 0.05, * 0.1 .

5. :

swork	-0.24	0.40	
edu1	1.41	0.95	
edu3	0.07	0.12	
edu4	-0.13	0.14	
dmarr	-0.00	0.09	
age	-0.11	0.14	
agesq	0.00	0.00	
gender	0.18	0.06	***
_cons	3.45	1.68	**

: 1001
: *** 0.01, ** 0.05, * 0.1 .

6. : 가

swork	-0.12	0.41	
edu1	1.82	0.98	*
edu3	0.08	0.13	
edu4	-0.15	0.15	
dmarr	-0.00	0.10	
age	-0.09	0.14	
agesq	0.00	0.00	
gender	-0.00	0.06	
_cons	3.18	1.74	*

: 1001
: *** 0.01, ** 0.05, * 0.1 .

7. :

swork	- 1.04	0.39	***
edu1	0.02	0.94	
edu3	0.15	0.12	
edu4	0.28	0.14	**
dmarr	0.10	0.09	
age	-0.17	0.14	
agesq	0.00	0.00	
gender	0.06	0.06	
_cons	4.16	1.66	**

: 1001
: *** 0.01, ** 0.05, * 0.1 .

8. :

swork	-0.17	0.55	
edu1	1.36	1.22	
edu3	-0.16	0.18	
edu4	-0.27	0.21	
dmarr	0.07	0.12	
age	0.03	0.19	
agesq	-0.00	0.00	
gender	-0.07	0.08	
_cons	1.80	2.26	

: 922
: *** 0.01, ** 0.05, * 0.1 .

9. :

swork	-0.52	0.55	
edu1	1.29	1.22	
edu3	-0.22	0.18	
edu4	-0.13	0.21	
dmarr	0.07	0.12	
age	0.19	0.19	
agesq	-0.00	0.00	
gender	-0.05	0.08	
_cons	-0.11	2.28	

: 922
 : *** 0.01, ** 0.05, * 0.1 .

10. :

swork	-0.89	0.44	**
edu1	2.12	1.05	**
edu3	0.19	0.13	
edu4	0.02	0.16	
dmarr	-0.01	0.10	
age	-0.13	0.15	
agesq	0.00	0.00	
gender	0.16	0.07	**
_cons	3.65	1.86	*

: 1001
 : *** 0.01, ** 0.05, * 0.1 .

()

- p.60 가 .
· (1) (2)가 , 가? (2)

· (1) , (2) 가 . ,

· 가? (1)
가?

- < 6 >
! 가
, < 6 > .

- 가 가
, 가?
· 가 , output 가
, 가

· 가
voice . voice

가
가 가 .
·

가