

ミクロデータサイエンス

Problemset3

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1 Step 2 回帰分析

A write_regression_models の修正

```
1 write_regression_models <- function() {  
2   regression_models <- list(  
3     # correct model  
4     "(1)" = log10(income_child) ~ effort + log10(income_parent),  
5  
6     # omitted variables models  
7     # model 2  
8     "(2)" = log10(income_child) ~ log10(income_parent),  
9     # model 3  
10    "(3)" = log10(income_child) ~ effort,  
11  
12    # measurement error models  
13    # model 4  
14    "(4)" = log10(income_child_noisy) ~ effort + log10(income_parent),  
15    # model 5  
16    "(5)" = log10(income_child) ~ effort_noisy + log10(income_parent),  
17    # model 6  
18    "(6)" = log10(income_child) ~ effort + log10(income_parent_noisy)  
19  )  
20  
21  return(regression_models)  
22 }
```

B 回帰分析表のアウトプット

Regression Table

	(1)	(2)	(3)	(4)	(5)	(6)
Own effort	1.09		1.27	1.05		1.12
	(0.17)		(0.16)	(0.17)		(0.16)
Log Parents Income	0.39	0.63		0.39	0.52	
	(0.15)	(0.14)		(0.15)	(0.15)	
Own effort with error					0.47	
					(0.12)	
Log Parents Income with error						0.35
						(0.13)
Constant	-0.68	0.27	0.92	-0.59	-0.08	-0.49
	(0.78)	(0.77)	(0.40)	(0.78)	(0.77)	(0.70)
Num.Obs.	1000	1000	1000	1000	1000	1000
Std.Errors	by: household_id by: household_id by: household_id by: household_id by: household_id by: household_id					

Heteroskedasticity robust standard errors clustered at household level

C モデル 1 の推定値の 95%信頼区間

$$1.09 - 1.96 \times SE_{HAC}(\hat{\beta}_1) \leq \hat{\beta}_1 \leq 1.09 + 1.96 \times SE_{HAC}(\hat{\beta}_1) \quad (1)$$

$$1.09 - 1.96 \times 0.17 \leq \hat{\beta}_1 \leq 1.09 + 1.96 \times 0.17 \quad (2)$$

$$0.7568 \leq \hat{\beta}_1 \leq 1.4232 \quad (3)$$

$$0.39 - 1.96 \times SE_{HAC}(\hat{\beta}_2) \leq \hat{\beta}_2 \leq 0.39 + 1.96 \times SE_{HAC}(\hat{\beta}_2) \quad (4)$$

$$0.39 - 1.96 \times 0.15 \leq \hat{\beta}_2 \leq 0.39 + 1.96 \times 0.15 \quad (5)$$

$$0.096 \leq \hat{\beta}_2 \leq 0.684 \quad (6)$$

D 帰無仮説 $\beta_1 = 0$ と $\beta_2 = 0$ をそれぞれ棄却できるか

有意水準を 5% で検定をすると, $\beta_1 = 0$ は 95% の信頼区間から外れるため, 帰無仮説は棄却される. 同様に, $\beta_2 = 0$ は 95% の信頼区間から外れるため, 帰無仮説は棄却される.