

# Effect of English-Medium Instruction on Earnings

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# Motivation

- In non-English speaking countries the English-medium instruction is controversial.
  - **For universities**, a mechanism to attract better qualified students.
  - **For individuals**, a key to better labor market outcomes.
  - **For educators**, lowers learning, and detrimental to native language and culture
  - **For some researchers**, widens inequalities.

# Research question

Does English-medium instruction in higher education increase wages in labor market?

- Value of the English as a foreign language
  - Levinsohn (2004), Munshi & Rosenzweig (2006), Lang & Siniver (2006)
- Effect of English-medium instruction on labor mkt outcomes (primary or secondary education):
  - Angrist & Lavy (1997), Angrist, Chin, & Godoy (2008), Chakraborty & Bakshi (2012) and Anghel, Cabrales, & Carro (2012)

# Contribution

- First study investigating the effect of English-medium instruction in higher education on wages
- English is a foreign language in Turkey
- No colonial history
- Found positive effect on wages ranging 10%-22% in different estimations.

- Business and economics departments in two universities in Turkey.
- Departments in both universities offer English and Turkish-medium undergraduate programs
- Data collected from graduates in 2005-2017

# Data

Program	Anadolu Uni.	Dokuz Eylül Uni.	Whole sample
Economics (English)	26,27	87,84	44,72
Economics (Turkish)	42,39	7,60	31,97
Business (English)	7,80	3,95	6,65
Business (Turkish)	23,54	0,61	16,67
Total	100,00 (769)	100,00 (329)	100,00 (1098)

Variable	Obs.	Mean	Std. Dev	Min	Max
Earnings	741	3970,90	2835,00	360	28000
log(earnings)	741	8,11	0,57	5,89	10,23
Male	1098	0,46	0,50	0	1
Age	1090	27,97	3,31	23	44
Married	1097	0,24	0,43	0	1
English program	1098	0,51	0,50	0	1
Anadolu Univ.	1093	0,70	0,46	0	1
Economics	1098	0,77	0,42	0	1
GPA	1078	2,73	0,43	2	3,94
Master's	1097	0,32	0,47	0	1
Employed	1098	0,70	0,46	0	1



Variable	Obs.	Mean	Std. Dev	Min	Max
Experience	1091	3,60	2,89	0	14
Tenure (Year)	740	2,36	2,72	0	13
Internship	1098	0,51	0,50	0	1
Worked while being student	1098	0,35	0,48	0	1
Erasmus	1098	0,20	0,40	0	1
Computer	1098	0,28	0,45	0	1
Clubs	1098	0,50	0,50	0	1
Father's schooling (Year)	1095	10,45	4,07	0	18
Mother's schooling (Year)	1096	8,68	4,36	0	18
Father worked while studying	1096	0,92	0,27	0	1
Mother worked while studying	1096	0,40	0,49	0	1

# Graduates by high school types and programs

	Turkish-medium	English-medium	Whole sample
Anadolu/Soc. Science High	41,54	62,41	52,28
Anadolu Vocational	1,50	1,06	1,28
Vocational High School	3,76	1,42	2,55
Science High School	1,13	1,95	1,55
General High School	41,92	20,92	31,11
Foreign Language/Süper High	10,15	12,23	11,22
Total	100,00	100,00	100,00

# Educational Status of Parents (%)

	Turkish-medium	English-medium	Whole sample
Father's Education			
Below high school	41,28	35,05	38,08
High school	29,83	27,76	28,77
University or above	28,89	37,19	33,15
Total	100,00	100,00	–
Mother's Education			
Below high school	61,35	45,12	53,01
High school	24,58	31,62	28,19
University or above	14,07	23,27	18,8
Total	100,00	100,00	–

# Raw Differences

Variable	Turkish (mean)	English (mean)	Difference	$p$ -value
Earnings	3261,40	4540,50	-1279,10***	0,000
log(earnings)	7,95	8,25	-0,296***	0,000
Male	0,47	0,46	0,008	0,769
Age	27,80	28,10	-0,325	0,105
Married	0,23	0,25	-0,019	0,460
Anadolu	0,95	0,46	0,488***	0,000
Dokuz Eylül	0,05	0,54	-0,488***	0,000
Economics	0,66	0,87	-0,213***	0,000
GPA	2,67	2,78	-0,106***	0,000
Employed	0,64	0,76	-0,120***	0,000

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

# Base Model

$$\log w_i = \alpha + \tau D_i + X_i' \beta + \varepsilon_i$$

$$D_i = \begin{cases} 1 & : \text{Graduated from English-medium program} \\ 0 & : \text{other} \end{cases}$$

	(1)	(2)	(3)	(4)
English-medium	0,212*** (6,09)	0,210*** (5,90)	0,115*** (3,33)	0,117*** (3,33)
Male	0,216*** (6,88)	0,219*** (6,94)	0,192*** (6,18)	0,193*** (6,24)
Married	0,0851* (2,06)	0,0855* (2,06)	0,100* (2,58)	0,0991* (2,54)
Economics	0,112** (2,75)	0,118** (2,94)	0,0903* (2,33)	0,0943* (2,44)
Anadolu	-0,100* (-2,31)	-0,0956* (-2,20)	-0,0985* (-2,40)	-0,0938* (-2,30)
Firm size (categoric)	-	-	✓	✓
Occupation (categoric)	-	-	✓	✓
Father Education (categoric)	-	✓	-	✓
Mother Education (categoric)	-	✓	-	✓
N	721	719	715	713
R-squared	0,494	0,500	0,570	0,574

# Endogeneity

- Self selection into programs
- Sample selection
- Observable selection vs unobservable selection

# Observable Selection

Model	ATE	ATT
Regression Adjustment	0,196***	0,202**
Inverse Probability Weighting	0,188***	0,210**
Propensity Score Matching	0,225***	0,313***
Nearest Neighbor Matching	0,205***	0,218***

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$



# Sample Selection (Heckman, FIML)

	(1)	(2)	(3)	(4)
Log earnings				
English-medium	0.180*** (4.73)	0.179*** (4.68)	0.100** (2.75)	0.102** (2.79)
Firm size (categoric)	–	–	✓	✓
Occupation (categoric)	–	–	✓	✓
Father Education (categoric)	–	✓	–	✓
Mother Education (categoric)	–	✓	–	✓
athrho	-0.714*** (-3.41)	-0.719*** (-3.68)	-0.622* (-2.44)	-0.639** (-2.77)
ln $\sigma$	-0.852*** (-14.14)	-0.858*** (-14.55)	-0.954*** (-14.10)	-0.955*** (-14.73)
(First Stage) LR $\chi^2$	229,43***	229,43***	228,94***	228,94***

**Thank You for Listening**

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