The importance of high-school preparation for economics' undergraduates

Work in progress

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Motivation

Motivating factors for this study

- Low entry grades to university
- Low grades of university students
- Low graduation rates compared to the EU or the OECD average
- Citizens (students, their parents, educators) are concerned with the above

Aims

1. To look at correlations between high-school performance and university performance
2. To look at correlations between performance in specific school subjects and university courses
3. To look at the above correlations conditional on students' choices about their preferred field of study

Institutional details

## Admission requirements to the Greek university system

System has changed in its details several times but in essence:

1. Students in their last years in high-school choose which domain they want to focus on: hard sciences, technological subjects or humanities

2. Depending on their focus domain, they take national-level exams in the last year of high school on 4 or 5 subjects

3. Their exam grades together with their performance on these subjects in school (last year of high school) determine their overall grade

4. Students report their preferences regarding the Departments they are interested in attending

5. A central system matches students to Departments depending on students overall grade and preferences and on Departments allocation

6. The number of persons admitted to each university department complies with the principle of "numerus clausus"

Number of university student positions available

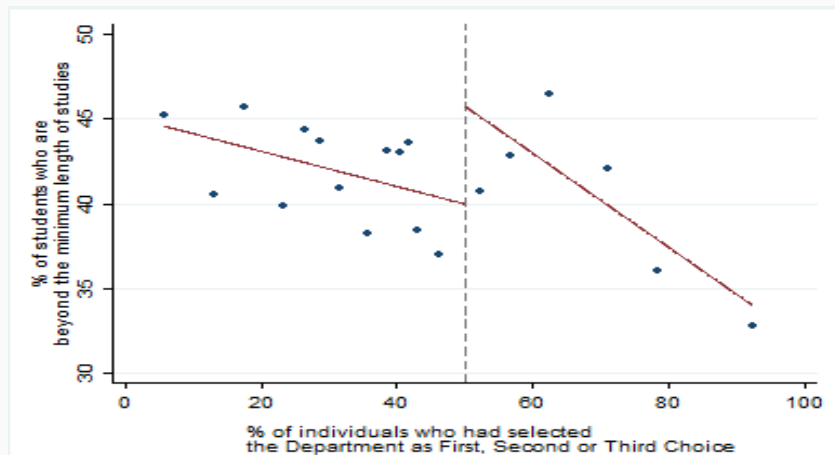- The number of university student positions available in each Department is determined every year by the Ministry of Education
- The Ministry asks for the opinion of Departments but their view is only one factor in the Ministry's decision ▸ Graph
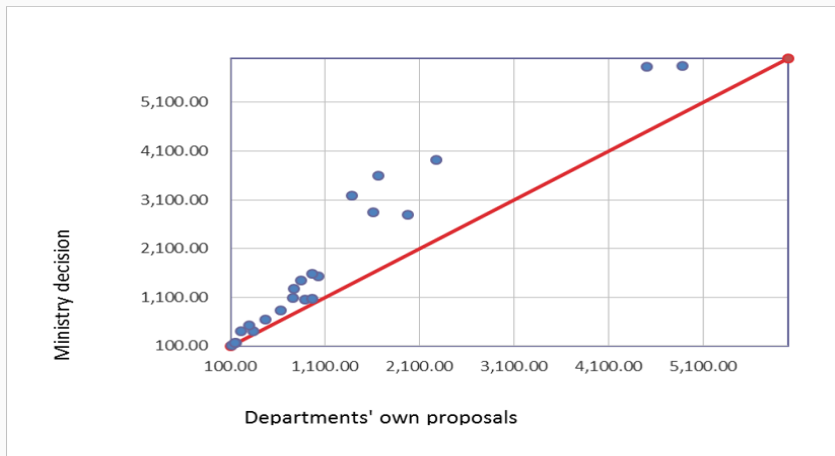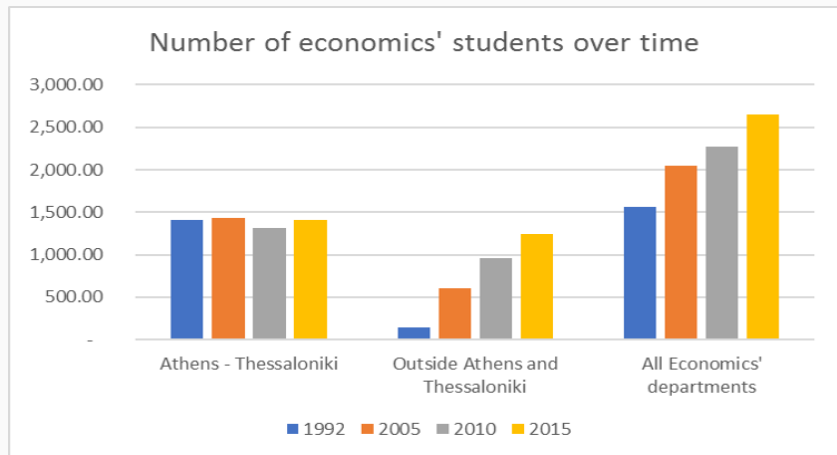
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Are students preferences important for graduation rates

Looking closer at Economics' students

A specific Economics Department

Characteristics of students in the Department

Table 1: Performance and Choices in High School of entrants to the Department during 2004-06

	2004	2005	2006
Means of entry to University			
Panhellenic exams	82,7	80,9	83,5
Other means	17,3	19,1	16,5
Focus domain followed in High-School			
Technological subjects	78,3	77,1	87,8
Hard Sciences	14,5	13,7	7,4
Humanities	7,2	9,2	4,7
High-school performance			
Grade in penultimate year in High-School	16,00	15,95	16,17
School leaving certificate grade	17,026	16,87	16,57
Average overall points for entry	16.005,60	15.714,19	15.783,87
% that selected the Department as first choice	23,6	14,9	16,5
% that selected the Department as second to fifth choice	25,4	17,7	27,7
% that selected non-economics department as first choice	35,6	47,2	67,7
Source: Departmental data			

Table 2: OLS estimates of grades' determinants

Variables	Maths	Macro	Micro
Men	0.001	0.010	-0.114
	(0.133)	(0.137)	(0.132)
School leaving certificate grade	0.174*	0.252***	0.095
	(0.077)	(0.075)	(0.068)
Advanced Maths grade	0.050*	0.054*	0.039
	(0.021)	(0.022)	(0.022)
Modern Greek Language	-0.042	-0.010	0.020
	(0.032)	(0.033)	(0.027)
Order of preference (1-38)	-0.013	0.013	-0.012
	(0.010)	(0.011)	(0.009)
Constant	-2.468	-4.636***	-2.406
	(1.320)	(1.228)	(1.261)
Observations	237	237	236
R^2	0.157	0.115	0.101

Robust standard errors in parentheses

*** p $<$0.001,**p$<$0.001, *p$<$0.05, ¯p$<$0.10

Searching for grades' determinants - ologit estimates (Marginal effects)

Table 3: Ordered logit estimates - Mathematics I

Variables	Lowest grade class		Highest grade class	
	Marginal effects	Std. Error	Marginal effects	Std. Error
Men	0.032	0.058	-0.018	0.034
School leaving certificate grade	-0.058˜	0.034	0.033˜	0.019
Advanced Maths grade	-0.021*	0.010	0.012*	0.006
Modern Greek Language	0.027˜	0.014	-0.015˜	0.008
Order of preference	0.010*	0.005	-0.0058	0.003

Standard errors in parentheses
*** p $<$0.001,**p$<$0.001, *p$<$0.05, ˜p $<$0.10

Searching for grades' determinants - ologit estimates (Marginal effects)

Table 4: Ordered logit estimates - Macroeconomics I

Variables	Lowest grade class		Highest grade class	
	Marginal effects	Std. Error	Marginal effects	Std. Error
Men	0.03	0.06	-0.015	0.033
School leaving certificate grade	-0.081**	0.03	0.042**	0.020
Advanced Maths grade	-0.029***	0.01	0.015***	0.005
Modern Greek Language	0.008	0.02	-0.004	0.008
Order of preference	-0.004	0.01	0.0023	0.003

Standard errors in parentheses
*** $p < 0.001$,**$p < 0.001$, *$p < 0.05$, ˜$p < 0.10$

Searching for grades' determinants - ologit estimates (Marginal effects)

Table 5: Ordered logit estimates - Microeconomics I

Variables	Lowest grade class		Highest grade class	
	Marginal effects	Std. Error	Marginal effects	Std. Error
Men	0.022	0.062	0.014	-0.35
School leaving certificate grade	-0.057	0.035	0.012	0.009
Advanced Maths grade	-0.016	0.01	0.0035	0.0024
Modern Greek Language	0.0029	0.013	-0.00062	0.0027
Order of preference	0.0037	0.0048	-0.0008	0.0011

Standard errors in parentheses
*** p $<$ 0.001,**p$<$0.001, *p$<$0.05,˜p $<$0.10

Searching for grades' determinants - quantile regression estimates

Table 6: Quantile regression estimates of course grades

Variables	(1) Maths	(2) Maths	(3) Macro	(4) Macro	(5) Micro	(6) Micro
	0.5 Quantile	0.75 Quantile	0.5 Quantile	0.75 Quantile	0.5 Quantile	0.75 Quantile
Women	-0.030	0.121	-0.144	-0.123	0.209	0.047
	(0.225)	(0.170)	(0.207)	(0.306)	(0.213)	(0.285)
School Leaving Certificate grade	0.230*	0.148	0.294**	0.324*	0.000	0.097
	(0.114)	(0.086)	(0.105)	(0.155)	(0.108)	(0.144)
Advanced Maths grade	0.065	0.101***	0.093**	0.082	0.000	0.016
	(0.036)	(0.027)	(0.033)	(0.049)	(0.034)	(0.046)
Modern Greek language	-0.014	-0.077*	0.034	-0.026	-0.000	0.007
	(0.051)	(0.039)	(0.047)	(0.070)	(0.048)	(0.065)
Choice< 3 & >=8	-0.032	0.019	0.396~	0.034	-0.628*	-0.535
	(0.260)	(0.196)	(0.239)	(0.354)	(0.246)	(0.329)
Choice < 8	-0.064	-0.321	0.091	0.178	-0.628**	-0.582~
	(0.253)	(0.190)	(0.232)	(0.344)	(0.240)	(0.321)
Constant	-3.819~	-1.355	-6.533***	-4.903~	-0.243	-1.234
	(1.940)	(1.461)	(1.782)	(2.639)	(1.834)	(2.455)
Observations	237	237	237	237	236	236

Standard errors in parentheses, $*** p<0.001$, $** p<0.01$, $* p<0.05$, $\sim p<0.10$

Kernel density estimate

kernel = epanechnikov, bandwidth = 0.1220
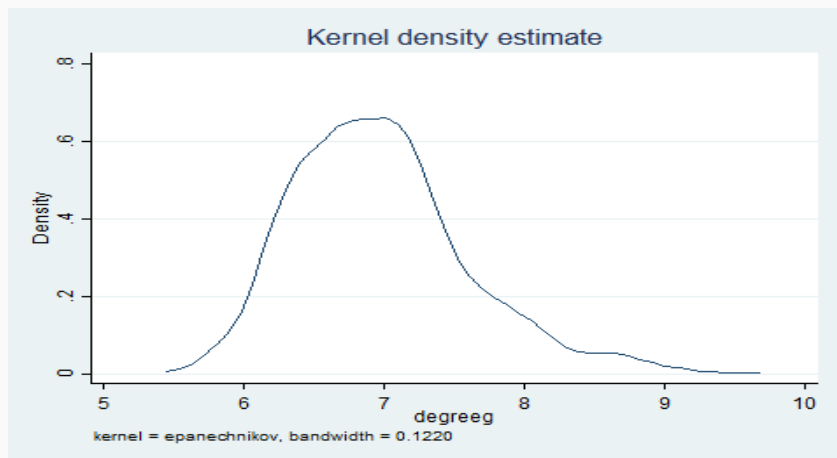
Determinants of degree grade

Table 7: OLS estimates of degree grade determinants

Variables	Basic	Add length of studies
Demographics		
Men	-0.157*	0.050
	(0.072)	(0.072)
High-school performance		
School leaving certificate grade	0.228***	0.164***
	(0.038)	(0.036)
Advanced Maths grade	0.035**	0.035**
	(0.013)	(0.012)
Choice (Reference group: choice>8)		
Choice >=3 & Choice <=8	0.137~	0.130*
	(0.076)	(0.063)
Length of studies		
Length of studies		-0.115***
		(0.014)
Constant	2.825***	5.089***
	(0.654)	(0.646)
Observations	237	237
R^2	0.294	0.458

Standard errors in parentheses

*** p $<$0.001,**p$<$0.001, *p$<$0.05,~p $<$0.10

Summary & Conclusions

Summary & Conclusions

- High school preparation impacts on University performance
- Performance on core courses is clustered around the pass grade
- Performance on non-core courses appear to even out the distribution of the degree grade
- Students' preferences appear to impact on degree grade

Thank you for your attention

References

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