The Financial Crisis and the Choice of College Major

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Abstract

Economic conditions may affect educational choices. In this paper we investigate the impact of the recent financial crisis in Greece on college applications. In particular, we ask how the financial turmoil has reshaped the demand for particular college majors. The paper uses a difference-in-difference approach for the pre and during crisis era to disentangle preferences over twenty one broad major categories and over college city amenities. We find that job insecurity turns college applicants away from academically demanding college majors, while options with better job prospects become more popular.

1 Introduction

The business cycle is known to rearrange the production factors within an economy, causing some sectors to prosper and others to shrink. The short run oscillations in the growth of various sectors causes changes in the available job opportunities and therefore in the popularity of different college majors.

The consequences of graduating in a recession are associated with long-term earnings declines (Kahn (2010), Wee (2013) and Oreopoulos et al. (2012)). Previous studies have shown that economic fluctuations affect human capital investment including college enrollment (Hershbein (2012)) and college completion (Kahn (2010)). Recent studies have found a link between the business cycle and the choice of college major(Bradley (2012), Arcidiacono et al. (2010)).

In this paper, we explore the short run impact of a recent financial crisis on preferences for the universe of available college majors. For this purpose, we use a novel dataset from Greece. The crisis in Greece has been one of most severe crises in the developed world since 1929. Although Greece's GDP had started declining since 2008, the austerity measures taken in late 2009 resulted in a very abrupt and much deeper deceleration of the economy.

2 Data

College admission in Greece is based on a centralized system and students are admitted directly to departments within universities. Generally, each university department offers a single major and transfers to a different major are not allowed at any stage. Students take exams in May of their senior year of high school and their performance in those exams is the sole criterion for college admission. Goulas and Megalokonomou (2015) describe the process in detail. Once the results of the exams are announced, student submit a ranked list of university departments they would like to be admitted to. There is only one admission cycle every year in July. Submitting a list or listing additional university departments doesn't involve any financial cost

for the student. This institutional setting guarantees truth revelation of preferences. Nevertheless, truth-telling in the college application process is independent of the admission outcome as misreporting is a dominated strategy as long as the applicant's expected probability of admission is non zero. Submitting the list requires multiple checks by the student, eliminating errors almost surely and thus trembling hand equilibria are not an issue.

Our dataset includes information on the number of college applicants for each university department in Greece from 2003 to 2011. In addition, we observe how many applicants listed each university department as their first, second, or third choice. Our preferences information are unconditional on college admission. We isolate the effect of uncertainty regarding economic prospects on educational choices from subsequent changes by using data from the early years of the crisis. The dataset is described in Table 1.

3 Empirical Strategy

We measure the effect of the financial crisis affects on the preferences for college majors, using the following differences-in-differences specification:

$$Y_{d,f,t} = \alpha + \beta Crisis_t * Fields_f + \gamma Field_f + \delta Crisis_t +$$
$$\mu Campus_d FE + \kappa Crisis_t * Campus_d FE + \epsilon_{d,f,t}$$

where $Y_{d,f,t}$ indicates three different outcomes: The percentage of applicants to a particular University Department in location d, broad major category f and year t who listed it as their first choice, and the percentage of those who listed it among their first three choices in the preference list. Results are shown in Table 3, column 1 and column 2 respectively.

The main coefficient of interest is β and measures the effect of the recession on the popularity each field relative to a benchmark field (Dentistry). The variable "Crisis" is a dummy variable that takes the value one after 2009. We include campus location fixed effects to control for popularity over specific cities. The interaction term between the crisis dummy and the campus location FE account for differences in the severity of the financial crisis in different cities. The standard errors are clustered at the major level.

3

4 Results and Discussion

The results in Table 3 imply that in adverse economic conditions, students switch away from college majors that 1) have poor employment prospects and 2) are more academically rigorous. We use Dentistry as our benchmark major, since the effect of the crisis on its popularity is negligible, as shown in Table 2.

During the recession, students increase their reported preference for fields like: Military, Mathematics and Statistics, Humanities and Liberal Art, Nursing , Veterinary Science, Pharmacy, Medicine, Psychology, Journalism, Biology and Law. Conversely, Business and Management, Agriculture and Forestry, Education, Language, History and Physical Education, Engineering and Computer Science fall in popularity during the crisis. Our finding are in parallel with Shatkin (2008) who report that job opportunities in the Military and Health Care are relatively less affected during economic turmoil. Furthermore, as the wage gap across majors lessens during a recession, Humanities and Liberal Art Departments become more popular, as opposed to Business/Management and Engineering/Computer Science. Bradley (2012), Arcidiacono et al. (2010) find similar results. The fields of Medicine and Law are very attractive even during the crisis, due to good employment prospects.

It's interesting to note the popularity of majors with little job precarity during a recession. In the left panel of Figure 1 we draw the percentage of college applicants who listed military and police academies as their number one choice over time. We see that it follows a pattern similar to that of youth unemployment (right panel) with time lag. This is natural as students report preferences based on expectations. The military in Greece allows students to enlist and pursue tertiary education at the same time. [1] Individuals who join the armed forces sign an enlistment contract, binding them to service after graduation and receive immediately a monthly stipend.

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[1] Interested students include combined choices in their preference list. For example one may list "Economics major while in the armed forces".

5   Conclusion

This is the first paper that looks into major switching as a result of the recent financial crisis in Greece. Popularity of academically more rigorous majors drops among college applicants as the economic returns may be lower during a recession. Moreover, college applicants turn to majors with greater job security. Thus, the number of high school graduates wishing to enlist in the armed forces increase with youth unemployment. Our findings contribute to the understanding of workforce dynamics during economic downturns and may inform policies that fight unemployment.

References

Arcidiacono, P., J. Hotz, and K. Songman (2010). College major choices using elicited measures of expectations and counterfactuals. *National Bureau of Economic Research, Working Paper 15729.*

Bradley, E. S. (2012). The effect of the business cycle on freshman major choice. *Working Paper.*

Goulas, S. and R. Megalokonomou (2015). Social interactions through space and time: Evidence from college enrollment and academic mobility. *Working Paper, University Library of Munich, Germany 65882.*

Hershbein, B. J. (2012). Graduating high school in a recession: Work, education, and home production. *The BE Journal of Economic Analysis and Policy 12.*

Kahn, L. (2010). The long-term labor market consequences of graduating from college in a bad economy. *Labour Economics, Elsevier 17.*

Oreopoulos, P., T. von Wachter, and A. Heisz (2012). The short- and long-term career effects of graduating in a recession. *American Economic Journal: Applied Economics 4.*

Shatkin, L. (2008). *150 Best Recession Proof Jobs.* Jist Publishing.

Wee, S. L. (2013). Born under a bad sign: The cost of entering the job market during a recession. *University of Maryland mimeo.*

Table 1: Descriptive Statistics

	No of Applicants	No of University Departments
2003	85967	438
2004	84529	463
2005	84529	463
2006	81213	464
2007	70237	467
2008	65388	468
2009	62654	484
2010	75185	485
2011	95949	485
N	705,652	4217

Table 2: Before and during crisis preferences

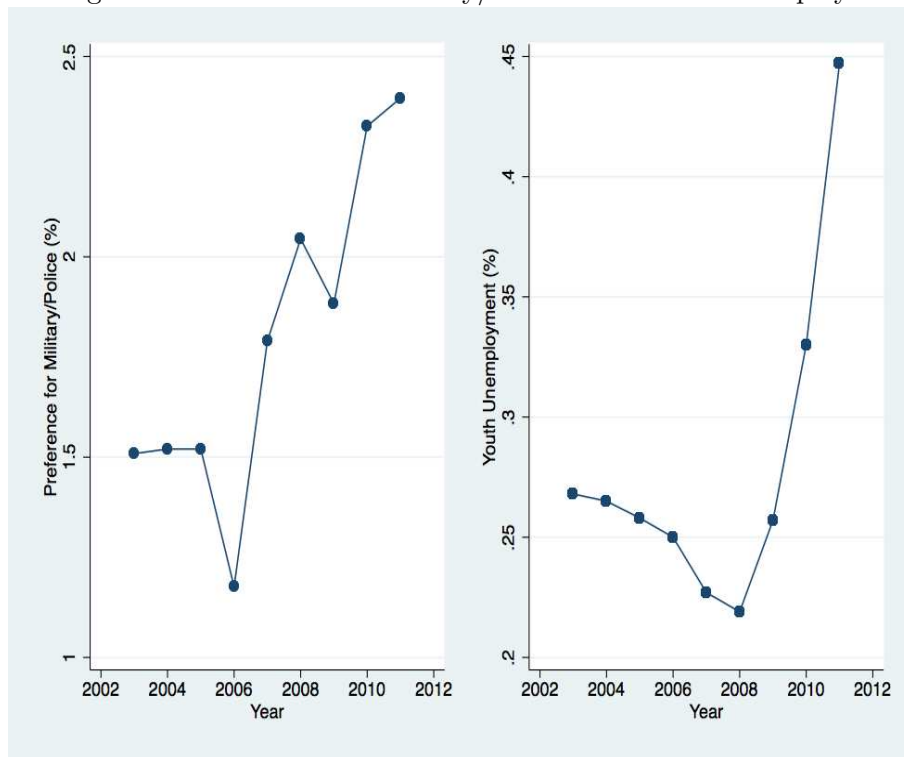|	Pre-Crisis	Crisis	Diff.	Std. Error
Engineering and computer science	0.704	0.705	0.001	.075
Agriculture and forestry	1.969	1.893	-0.077	.460
Economics	3.743	3.451	-0.291	.182
Mathematics and Statistics	1.805	2.268	0.462	.272
Business and Management	12.717	9.757	2.959*	1.031
Biology	.877	1.142	0.266*	.078
Physical and Earth Science	1.568	1.800	0.232	.186
Liberal Arts and Humanities	2.597	3.274	0.677**	.159
Psychology	1.630	2.449	0.619**	.159
Social, Political and European Studies	1.665	2.108	0.443	.324
Nursing and other Health	6.013	8.673	2.660**	.585
Journalism	.900	.862	-0.037	.143
Education,Language, History and P.E.	21.045	20.708	-0.337	2.214
Home economics	.102	.042	-0.060	.033
Medicine	2.578	2.890	0.312	.415
Pharmacy	.835	1.131	0.295	.184
Law	3.655	3.756	0.101	.509
Veterinary Science	.224	.339	0.115***	.013
Dentistry	20.950	17.350	-3.601	1.899
Police and Military	1.635	2.361	0.726*	.216
Other	4.208	4.318	0.109	.781

Note: The table shows average percentage of college applicants listing a university department in a particular field as their number one choice. Sample: 9 years.

Table 3: OLS Regression Results

	(1)		(2)	
Crisis	-0.012	(0.010)	-0.030	(0.027)
Unemployment	-0.059	(0.014)***	-0.154	(0.035)***
Crisis*Computer Science and Engineering	-0.056	(0.008)***	-0.128	(0.014)***
Crisis*Agriculture and Forestry	-0.122	(0.014)***	-0.374	(0.041)***
Crisis*Economics	-0.0001	(0.012)	-0.037	(0.018)*
Crisis*Mathematics and Statistics	0.037	(0.012)***	0.084	(0.024)***
Crisis*Business and Management	-0.060	(0.009)***	-0.173	(0.018)***
Crisis*Biology	0.028	(0.010)***	0.098	(0.023)***
Crisis*Physical and Earth Science	0.005	(0.008)	0.015	(0.017)
Crisis*Liberal Arts and Humanities	0.015	(0.004)***	0.027	(0.009)***
Crisis*Psychology	0.194	(0.010)***	0.475	(0.019)***
Crisis*Social, Political and European Studies	0.021	(0.012)	0.005	(0.017)
Crisis*Nursing and other health	0.057	(0.008)***	0.177	(0.014)***
Crisis*Journalism	0.011	(0.011)	0.052	(0.020)**
Crisis*Education, Language, History and P.E.	-0.025	(0.004)***	-0.070	(0.014)***
Crisis*Home Economics	-0.033	(0.010)***	-0.115	(0.015)***
Crisis*Medicine	0.026	(0.010)**	0.191	(0.023)***
Crisis*Pharmacy	0.089	(0.005)***	0.195	(0.011)***
Crisis*Law	0.005	(0.014)	0.280	(0.018)***
Crisis*Veterinary Science	0.056	(0.011)***	0.111	(0.018)***
Crisis*Police and Military	0.057	(0.008)***	0.080	(0.011)***
Crisis*Other	-0.012	(0.008)	-0.046	(0.014)***
Fields Dummies	✓		✓	
Campus Location Dummies	✓		✓	
Campus Location Dummies*Crisis	✓		✓	
R^2	0.34		0.42	
N	4,217		4,217	

Note: The table shows average percentage of college applicants listing a university department in a particular field as their number one choice (column 1) or within the first three choices (column 2) in the preference list. Standard error in the parenthesis.

Figure 1: Preference for Military/Police and Youth Unemployment

Left figure depicts the percentage of college applicants per year that listed military or police related majors as their most preferred choice . Right figure shows annual youth unemployment rate (%). Source for unemployment data: Eurostat.