
Munich Personal RePEc Archive

Which degrees do students prefer during recessions?

Megalokonomou, Rigissa and Goulas, Sofoklis

The University of Queensland, University of North Carolina at Chapel Hill

1 December 2016

Online at https://mpra.ub.uni-muenchen.de/75355/
MPRA Paper No. 75355, posted 04 Dec 2016 10:30 UTC

Which degrees do students prefer during recessions?

Sofoklis Goulas
Department of Economics
University of North Carolina at Chapel Hill
goulas@unc.edu

Rigissa Megalokonomou
Department of Economics
The University of Queensland
r.megalokonomou@uq.edu.au

Abstract

We examine how changes in the unemployment rate affect demand for college education, demand for different fields of university study and degrees' admission thresholds. We use panel data for applications submitted to the universe of undergraduate programs in Greece that span seven rounds of admission cohorts combined with a degree-specific job insecurity index, and time series on youth (ages 18-25) unemployment. We find that degree- and major-specific job insecurity turns applicants away from degrees and majors that are associated with poor employment prospects. Results indicate that the steep increase in the unemployment rate that started in 2009 is associated with an increase in the number of college applicants. The effect is heterogeneous across fields, with an increase in the demand for degrees in Psychology as well as for entrance to Naval, Police and Military Academies, and a decrease in the demand for degrees in Business and Management. We also find that the business cycle changes degrees' admission thresholds by affecting their popularity.

Keywords: demand for education, college major, unemployment, job insecurity, admission thresholds
JEL Classification: I26, J24

1 Introduction

Students may alter their decisions regarding post-secondary education during economic turmoil. The consequences of graduating in a recession are associated with long-term, negative effects on earnings (Kahn, 2010; Wee, 2013; Oreopoulos et al., 2012). Previous studies have shown that economic fluctuations affect human capital investment including college enrollment (Hershbein, 2012), college completion (Kahn, 2010) and graduate school attendance (Bedard and Herman, 2008; Johnson, 2013). The business cycle rearranges 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 change the available job opportunities, and therefore, the popularity of different college majors. Economic turmoil might affect the labor- market prospects of different professions in different ways, and thus, influence college applicants' expected returns from the related college majors. These differences could be large. For example, Joseph et al. (2012) show that the income gap of students specializing in different majors could be as large as the income gap between high school and college graduates.

The choice of college major is a good predictor of future earnings. During a recession, students might re-consider their expectations about future career paths and the earnings potential associated with a specific college major. Thus, switching majors could imply significant changes in a student's lifetime income. A large literature focuses on understanding which factors may affect students' choice of college major (Montmarquettea et al., 2002; Arcidiacono et al., 2010; Beffy et al., 2011; Dickson, 2010; Wiswall and Zafar, 2011; Porter and Umbach, 2006). This literature has examined how students form expectations about earnings and career prospects associated with a specific college majors, and how these expectations affect students' educational choices. This literature has largely focused on a static framework, or has been based on the analysis on a single cohort. However, the effect of the business cycle on students' preferences for the field of study or the major they select has received little attention. In this paper, we use new data on admission applications received by the universe of undergraduate degree programs

in Greece that span seven rounds of admission cohorts to examine the following two research questions: Do changes in unemployment affect college applicants' preferences for selected university fields? Do these differences in students' preferences affect college admission thresholds?

The contributions of this paper are threefold. First, we examine if the business cycle affects students' self-reported preferences for certain university degrees and majors. We proxy business-cycle fluctuations with a job-insecurity index associated with university degrees, and with the unemployment rate. Second, we undertake what we believe to be the first analysis of data on the universe of college applications and all public tertiary education institutions for an entire country, rather than for applications to departments of a specific university. Our data encompass degree applications submitted by every student who decides to pursue tertiary education nationwide over a period of seven years. Because the Greek system asks students to submit college applications in order of preferences, that specify the desired field of study at a specific university, we know how students rank their degree applications. In particular, we know which application is a student's top-, second-, third-, and later-choice indicating most, second-, third-, and later-most preferred degree choices. Third, we believe our work is the first to examine the effect of students' degree preferences on degree's entry requirement (i.e. admission threshold). Our analysis controls for field, campus city, time and university unobserved heterogeneity.

The crisis in Greece represents one of most severe economic events in the developed world since the Great Depression. Although Greece's GDP had started to decline in 2008, austerity measures taken in late 2009 resulted in a very abrupt and deep deceleration of the economy. Two characteristics of the Greek crisis made the downturn distinct in modern times: First, Greece experienced the most severe drop in GDP of any developed country not involved in a war. Second, the Greek recession was so widespread that if affected virtually every industry and every profession.

In this paper, we explore the short-run impact of a recent financial crisis on

the demand for post-secondary education in Greece. As the economic conditions deteriorate, people might adjust their education decisions. Preliminary figures from the OECD suggest that the crisis led more young adults to seek for post-secondary education. According to the OECD (2016), the share of the Greek population ages 25 to 34 with a post-secondary degree grew from 32.5 percent in 2011 to 40.1 percent in 2015 - a level that nonetheless remained below the OECD average of 42.1 percent. In this paper, we investigate how the crisis altered demand for available college majors, and changed admission thresholds. We argue that the business-cycle can redistribute degrees in terms of popularity and difficulty in gaining admission for the degrees (admission thresholds) that lead to various career prospects.

To examine these effects, we use a novel data set from Greece that includes information on college applications and admission thresholds for different degrees. In this way, we uncover information about students' most preferred subjects/degrees for the period 2005-2011, a time that preceded and includes the opening chapter of the economic crisis. We deliberately focus on the early effects of the recession on college application. As the recession progressed, changes in institutional settings as well as changes in the quality of college education due to financial constraints, may have exacerbated the recession's effects. Thus, by focusing on the early years of the recession we avoid the potential of additional uncertainty due to changes in such possible confounding factors - key issues that might make disentangling the short-run variation in demand for college education challenging. Our study is the first one to identify the relationship between youth unemployment and the demand for specific college degrees nationwide, while netting out supply-side dynamics. By analyzing college applications we are able to examine which fields and degrees are the most popular at different stages of the business cycle.

Two features of the analysis bear mention: First, this study focuses on the effect of the recession on students' preferences over university fields rather than their actual college major enrolment decisions. In a setting where the supply

of university places is exogenously determined and fixed, we can only examine changes in the popularity of each department rather than changes in the number of students who actually enrol in each field. Although the actual number of students who matriculate in each university department each year is relatively stable, the number of applications each department attracts across years varies significantly. Second, we are able to look at the effect of unemployment on students' top choice (most preferred) degree applications, because college applicants complete an ordered list of preferred university departments (for a field of study at a specific academic destination). All students are required to report their degree applications with a ranking of each preference. In our dataset, we observe the order of all applications each degree attracts. As a results, we are able to provide detailed, stylized facts about the demand for college education, and specific fields of study that students report as their most-preferred degrees.

The rest of the paper is structured as follows. Section 2 describes the institutional background. Section 3 describes the data. Section 4 discusses the drivers of the decision to apply to college. Section 5 provides analytical evidence. Section 6 discusses our results. Section 7 concludes.

2 The Greek Post-secondary Education System

2.1 How do students participate in the college admission process?

College admission in Greece is based on a centralized system, and students are admitted directly to departments within universities. Many other countries, such as Chile, China, Korea, Taiwan, and Turkey, use the same or similar centralized application systems for post-secondary education. Students apply to a major and university simultaneously (e.g. Chemical Engineering at the University of Athens)[1] as part of a centralized, score-based application process. Each university

[1]Similar systems include the state university system in California (see http://admission.universityofcalifornia.edu/how-to-apply/index.html, https://secure.csumentor.edu/support/pdfs/express_app.pdf, Chilean universities (Hastings et al., 2014) German universities (Braun et al., 2010), and Chinese universities (Chen and Kesten, 2013)

department in Greece offers a single undergraduate degree program, and transfers to a different degree are not allowed at any stage. We refer to an institution-major combination as a degree. Most degrees at these institutions require four or five years to complete on time. College degrees are linked to specific occupations. Access to some occupations is restricted to graduates with specific college degrees. For example, in order to become a licensed tourist guide in Greece one must obtain a college degree in History or Archaeology. Thus, preferences over college majors are strongly related to preferences over occupations.

In Greece, high school graduates and twelfth-grade students who aspire to pursue tertiary education take national exams in May, and their university admission score [2] is the sole criterion for college admission. The same admission process applies to returning high school graduates.[3]

Students usually take national exams in five common subjects (Language, Mathematics, Physics, Biology, History) and four compulsory, track-specific subjects. There are three tracks: Classics, Natural (or Exact Sciences) and Technical Studies (or Information Technology). Students can apply to university departments that are relevant to their track. For example, students outside the Classics track cannot apply to Law schools. Goulas and Megalokonomou (2015) describe the process in detail. Once the results of the national exams are announced, students are required to submit a list, ranking in order the university departments to which they would like to be admitted. The only way a student can avoid this university admission procedure is by not submitting a list of preferences. This might be the case for students who apply to undergraduate programs abroad.[4]

[2]The university admission score combines the national and school exam scores a student receives in twelfth grade. The national exam scores receive much heavier weight in the calculation of the university admission score than the school exam results.

[3]Returning high school graduates could keep their school exam score and retake the national exams any year after school graduation.

[4]These students take national exams but they do not submit a preference list. In this way, these students do not participate in the college application process.

2.2 How do they apply to specific university departments?

Submitting a ranked list of preferred university department is equivalent to submitting an application to each university department in the list. A centralized, computerized system at the Ministry of Education ranks students by their admission scores, and assigns the highest ranked student across the country to her top choice. The algorithm then moves to the second-highest ranked student across the country, and assigns her to the first department in her list in which there is an available place, and so on. Essentially, college admission functions like a queue where the choicest university program offers admission to the highest-performing student that has placed this degree in her preference list.

At the end of this process, every department announces the grade of the student with the lowest score it admitted in that year. This grade is considered to be the "admission-threshold score" or "cut-off score" in that year. Each degree has its own admission-threshold score. Students are accepted to specific degrees if and only if their admission score is above the cut-off. Thus, it is more difficult to gain admission to departments with higher admission thresholds. Each year, each university department admits a fixed number of applicants every year, as determined by the Ministry of Education. There is only one admission cycle, conducted every year in July. College education in Greece is free of charge for undergraduate students, and there are no pre-admission scholarships that could encourage a student to apply to a certain department instead of another.

Submitting a list is a prerequisite for participating in the university admission process. There is no room for gains from strategic misreporting of preferences. The ordering of university departments in the preference list is very important for a student because once a student gains admission to a specific university department, he cannot enroll in a university department in a lower position. Students report their preferences prior to the announcement of the degrees' admission thresholds and the admission outcomes. When a student completes her preference list, she is aware of previous years' threshold scores and the ranking of degrees based on previous years' threshold values. A student is aware of her own score

and the distribution of national exam scores but she is not aware of the threshold score of each department in the same year in which she applies. Nevertheless, a student does have incentives to aspire to university departments that report higher threshold admission scores in previous years than her own admission score. This is the case because admission thresholds vary from one year to another, and listing additional university departments does not involve any financial cost for the student. In this way, students in any given year have incentives to report potentially all university departments they desire to consider for admission and are relevant to their tracks.

In general, students have preferences for specific degrees. For example, a student who aspires to study Economics could potentially list all university departments that offer a degree in Economics in her preference list. In a framework of cost-less applications, each individual who desires to study Economics has incentives to include every Economics department in their preference list. Thus, every department could potentially receive an application from every applicant who desires to study the same major. Potentially, the only thing that differs from one preference list to the next applicant's list is the ordering of degrees. [5]

What determines a degree's admission threshold? The most important determinant is the demand for the specific degree as derived from students' top choice applications. Receiving many top choice applications makes the degree more popular and induces a higher competition for the available seats. In this case, the admission score of the last admitted student (which is equivalent to the cut-off score) is usually higher when there is more competition. The Ministry of Education can also affect the admission threshold by changing the number of available university seats. Reducing the supply of degree seats is an indirect way to accept only the highest-achieving students who have listed this specific degree. Thus, the admission score of the last admitted student will be higher, which increases the admission threshold.

Reporting a degree in any position except the top ones in one's preference list

[5] There might be students that have stronger preferences for a city than a degree. For example, a student might list degrees that are offered only in Athens and are relevant to his track.

does not necessarily affect a degree's admission threshold. Students might report degrees in lower positions in their preference list because they want to make sure that they will gain admission to some degree course, even if they are not actually committed to enroll. These students might never actually affect the admission threshold score because they might gain admission to a degree higher on their list, and so, at that point, they are no longer under consideration for any other degree course, or part of the process that leads to a degree's threshold determination. The algorithm that the Ministry of Education runs provides a unique application outcome[6] for each student based on his own ordered preferences, his admission score, and everyone else's ordered preferences and admission scores. Once students' ordered preferences are submitted, the algorithm produces only one possible admission outcome for each student. We call this "application outcome" and it is a unique combination of university department for each student. Students who change their minds after submitting their preference lists, and thus want to choose a degree course other than the algorithm match have to reapply for admission the next year. This is the case even if the other degree course is listed in a lower position that the one allocated to them by the Ministry of Education.

Table 1 shows some descriptive statistics for students who participated in the university admission process between 2005 and 2011. More than 80 percent of college applicants were admitted to some degree program. On average, students apply to 24 university departments/degree programs, and they gain admission to the choice that ranks eighth on their list. As indicated in Figure 1, the number of degrees students put on the preference list, and the students' rank for the degree program to which she ultimately gains admission change slightly across time.[7] Almost 70 percent of admitted students enroll in a university department that is in another city, and 56 percent of applicants are female students. The average cohort size is 62,257 students. In the period we study, on average, 60,257 students gain admission to any university department. It is also interesting to mention that, on average, 89 percent of applicants are new high school graduates, while the other

[6]The outcome refers to the degree course in which he is allowed to enroll in that given year.

[7]We thank an anonymous referee for bringing this point into our attention

11 percent have graduated from school in the past and are reapplying for college admission. A student might reapply to college for two reasons. First, she might not have been accepted to any university department in the past. Second, she might have previously been accepted to a university department, but decided to apply for admission to a different degree program.

3 Data

We examine the effect of a recession on college-major preferences by using college application data prior to and shortly after the beginning of the recent financial recession. We use a new and unique data set that contains administrative information from the Ministry of Education on the number of college applications for the universe of undergraduate degree programs offered in Greece from 2005 to 2011. We use panel data for the universe of undergraduate degree programs over a period of seven years. This data set contains college applications by both recent and returning high-school graduates who wish to enroll in tertiary education. In addition, we observe how many university departments were operating in each year, the fields in which the universities offered degrees, and the city of the campus location.

Because students report preferences prior to their admission outcomes and their enrolment decisions, our data on reported preferences are unconditional on college admission. Actual enrollment may change with changes in the number of slots available in each degree program over time. The Ministry of Education has the entire control over the supply of university seats. We also pull annual data on youth unemployment from the World Bank statistical reports.

We obtained individual level data from the Ministry of Education for each student who applies to college from 2005 to 2011. This dataset includes: gender and age of each applicant, the type of school (public, private, urban) each student attended, if a student is a new high school graduate or a returning student[8], if

[8]We refer to applicants who have previously graduated from high school as "returning students"

the student is admitted to some university department, each student's application outcome, number of degrees listed in each student's preference list and order of application outcome, students' annual national exam score, and the supply of seats per year. Figure 2 shows the number of college applicants who apply for college admission from 2005 to 2011. After 2009, the number of college applicants rises sharply and above the respective increase in new high school graduates. In Figure 3, we disentangle the pool of college applicants into two groups: new high school applicants and returning students, and we look at how these two numbers change over time. There are more returning students after 2009.

Table 2 provides information about the number of university departments operating in each field and each year. Here, we categorize university study fields into 22 broad, major groups.[9] It is interesting to observe that supply of university departments is relatively stable across years for each field. Over the seven years included in our data, 481 university departments operate for the complete time frame, and 24 university departments operate for fewer years.[10] No university department closes during the sample period.

Data on the degrees' admission thresholds are publicly available, and we obtained them from the Ministry of Education. We were unable to fully match the two datasets because some degree programs changed their names, some used different university identifiers in certain years, and other values are missing in the public documents. However, we obtained information on the degree cut-off score of 2,746 combinations of degrees and years.

4 The Argument

In this section we are considering the factors that, in our view, substantially drive education-related decision making in the period marking the beginning of the

[9]The are 21 categories and a category named "Other". In "Other" we put some degrees that are not associated with any of the remaining 21 categories, for example special religion studies.

[10]Specifically, one university department operates for six years; two university departments operate for two years; two university departments operate for four years; three university departments operate for five years; and sixteen university department operate for three years.

recent Greek crisis. This period offers a particularly interesting window into the decision-making process of applicants because the degree of economic turmoil is so pronounced that it almost certainly influences the potential pursuit of post-secondary education, and because these effects are likely to be heterogeneous for different sectors and professions.

4.1 Contextual influences

Our first point concerns contextual influences on the decision to apply to college. We group students into three categories based on the way the students make education-related decisions. In Greece, as elsewhere, one group of students come from families that strongly intend to send them to tertiary education and sometimes push them to pursue a particular academic or professional path - due to income, attitudes, professional and social status, and other factors. For these children, preferences regarding college education, in general, and about specific potential college majors have been formed or induced in advance of the time they actually apply to college. For those individuals, job-market conditions in the particular years involved likely have little or nothing to do with their predetermined college attendance and choice strategies (which may in itself take into account employment wages, status, and the like). We call these applicants " strategic applicants".

Next, there is a set of students who, either because of attitudes or socio-economic status, are less committed to a college application strategy, and most likely they respond more strongly to current information regarding the costs and benefits of college education. Following Nakata and Mosk (1987) we call the students in this set "marginal applicants". Between these two groups is a third category, students who are less committed to attaining a post-secondary education than the " strategic" group, but who are not part of the "marginal" group. These "core applicants" reach a decision over a significant number of years, and, as a result, they are less influenced by the exact economic conditions for the years in which they apply to college. Such individuals probably constituted a significant

fraction of school-goers in Greece around the beginning of the recent financial crisis because household income per capita had increased substantially in the two decades prior to the beginning of the debt crisis in late 2009, when household income per capita had reached what a peak. Presumably the improvement in real family disposable income played an important role in allowing the children of these households to pursue college educations. We believe that changes in the unemployment rate might mainly affect "marginal applicants" and much less so the third category of applicants.

4.2 Returns to education

Our second argument concerns returns to education. The job market[11] in Greece operates essentially like a queue. That is, persons seeking employment for the first time compete for jobs in a system in which the best-educated person is first in line for the choicest job position. The crisis led to layoffs and job rationing and overall conditions that increased competition for employment. To improve their employment prospects, students invest in more years of education; the same may be true for those who were not students when the crisis began - those who had found a job previously - possibly shortly - before the crisis, but were forced by payroll cutbacks into unemployment and ultimately led back towards additional education. Thus, in times of gloomy job market prospects, we hypothesize, an overall increase in the demand for college education is to be expected, ceteris paribus. Moreover, the drop of salaries across industries and job functions brought about by the crisis altered college applicants' anticipated post-graduation returns to education overall, and to specific college degrees. Graduates of all degrees saw their benefits reduced compared to the pre-crisis era; as a result, candidates began to reconsider each college major's expected costs and benefits, causing a reformulation of preferences or education in general as well as among specific college degrees.

[11] We refer to all jobs ie. public and private sectors

4.3 Quality of tertiary education

Our third argument is related to the quality of tertiary education provided during the crisis. During the first years of the recession, changes in the ratio of students to faculty, research work, and facilities are unlikely to affect candidates' decision regarding college application. It was still very early and the general view was that the crisis will not last long. We are not worried about price effects related to the direct college costs (e.g., tuition and fees) because students in Greece do not pay tuition fees and even the books are provided to them for free.

In countries where tertiary education is not free, the recession could affect students' willingness and ability to obtain a student loan, and thus, could also affect students' decisions over a specific college or major based on costs. In such countries, concerns that surfacing over whether mounting education debt and students' inability to repay their loans will be the next big economic bubble to burst Cronin and Horton (2009). Douglas (2016) estimates that the present discounted value of attending college for the median student varies between $85,000 and $300,000 depending on the student's major. This is less of a concern in Greece because every tertiary education institution is public, and free post-secondary education is a constitutional right.

A concern would be that students are less able to study in another city, because, after 2009, their parents are more likely to face difficulties in covering the cost of living. Again, we believe that in the early years of the crisis households had not experiences a considerable drop in their purchasing power. However, as the crisis progressed, after 2012, this financial inability to cover living costs is likely to restrict students options. We believe that potential education quality effects may exist after 2012 because many universities had to cut back on funds for research and facilities. Also, quantity rationing of slots, both overall and in specific degrees, took place, and were of paramount importance for applicants to university departments. Nevertheless, in our study we are able to net out any quantity effects by looking at self-reported preferences among specific degree program choices made by candidates prior to the outcome of their college application.

To summarize, current economic circumstances as well as expectations over returns to education and quality of education constitute crucial information for decisions concerning college applications during the recent recession.

5 Analytical Evidence

In this section we explore some of our hypotheses statistically, using both simple tables depicting time series of data, as well as regression analysis. We follow the universe of university departments in Greece which is also identical to the set of available college majors; this is because university department offers exactly one college major, although the same major may be offered by more than one department in different universities.

5.1 Time series statistics

Table 3 combines the supply of specific fields with the demand for specific fields. For each field and year we report a measure of weighted popularity for each field (d) that is constructed in the following way:

$$WeightedPopularityIndex_{f,t} = \frac{\#\text{ of applications received as number one choice}_{f,t}}{\#\text{ of existing degrees}_{f,t}}$$

To calculate the weighted popularity index [12], we divide the number of application each department receives as number one choice over the number of existing departments in each field and we look at the evolution of this index over time. Table 3 shows the weighted popularity index over time for various fields. For instance, in 2005, on average, 181 college applicants list economics as their top choice. In the same year, each department in Law receives on average 871 applications reporting a Law department as their top choice. The weighted popularity index clearly reflects relative preferences of college applicants across fields. For

[12] An alternative to the weighted popularity index would be the total number of applications a degree receives in a given year. However, it would not take into account possible changes in the supply of existing degrees.

example, a Dentistry department receives more applications listing it as top choice compared to a Veterinary department, given their supplies of degrees. Given that the supply of degrees in each field is relatively stable across years (Table 2), if we observe considerable changes in the weighted popularity index within fields over time, they will be caused by changes in the number of applications submitted to each degree this year (demand side). For example, in Social, Political and European Studies the relative changes in the weighted popularity index over time are not as large as the relative changes for Naval Academies over time. We also find that each degree across fields attracted on average 174 top-choice applications in 2005, indicated by the mean number of applicants variable.[13] The mean number of applications drops from 2005 to 2009 and then it increases.

5.2 Regression analysis

In this section we investigate the effect of the recent recession on the demand for fields of study at the university level, and for changes in degrees' admission thresholds. Using OLS, we examine how changes in the unemployment rate affect the demand for degrees or fields that have different employment prospects.

5.2.1 Job insecurity

We compile information on job prospects and job insecurity– that is, the fear of involuntary job loss – from a series of long-term surveys of college graduates in Greece published in Katsikas (2006)[14]. This information is used to construct an index of employment prospects of different college degrees, based on the structure of the Greek economy and year specific factors. For each university department, the index takes a value between 1, 2, 3, indicating good, mediocre and poor employment prospects. Katsikas (2006) stresses that the index is the result of the amalgamation of information from the career offices of all universities, the Hellenic

[13]The mean number of applications is the ratio of total number of applications submitted each year over the number of existing university departments in a given year

[14]This book acts as an informational guide for college applicants.

Bureau of Statistics, the OAED[15] employment observatory, and various labor unions. The index is intended to represent differences in structural and frictional unemployment among those with available college degrees and, most importantly, time-specific labor market conditions. As a result, it captures the economic and employment prospects associated with a degree in that year. Degrees with a low job insecurity index imply more available and stable employment conditions than degrees that are characterised by a high job insecurity index. The latter imply poor employment prospects, a higher difficulty to find a job and a higher risk of job loss.

Although this job insecurity index is provided for year 2006[16], it is still interesting to exploit across-field variation in this index and examine if job insecurity has an effect on the demand for college education. Intuitively, the demand for university majors that are tied to jobs with low job insecurity might increase. Good employment prospects might make a profession more appealing. Similarly, the popularity of college majors that are related to professions that face poor employment prospects might drop. This might affect professions subject to cuts in salaries or higher unemployment rate than other professions. These conditions create insecurity about a particular profession, sector or field of study. By restricting our sample to the year 2006, we exploit across-university and across-field variation in the job insecurity index to examine if job insecurity associated with a specific degree or field of study affects demand for college education.

In particular, we investigate the effect on job insecurity on college demand with the following regression model:

$$Y_{d,f,c} = b_0 + b_1 JobInsecurity_p + b_2 UniversityFE_u + b_3 CityFE_c + \epsilon_{d,f,c} \quad \textbf{(1)}$$
$$\text{where [p]=degree or field of study}$$

where $Y_{i,f,c,t}$ indicates the number of applications a particular degree d in field f and city c attracted that reported it as top, second or third choice.

[15]OAED is the Greek Manpower Employment Organization.

[16]We managed to find the book published in 2006. This book is published every year providing information about the current degree-specific job insecurity index. However, it is not easy to find the book for previous years, but only the current one.

The coefficient of interest is b_1, indicating how job insecurity affects demand for college degrees. The job insecurity index could refer to the expected employment prospects a specific degree or a specific field yields. In all specifications, we use campus-city fixed effects to control for unobservable time-invariant characteristics in campus-city demographics and characteristics that could drive students' preferences. Students might prefer a specific college because dorms in this city are modern and better-equipped or because the campus is in a lively city. We control for university-specific factors that affect students' preferences and are constant over time by including a full set of university fixed effects. For example, university fixed effects capture any "brand" or reputation effects, as well as other time-invariant unobserved characteristics (different faculty/ student ratio by university, level of resources), that could affect students' preferences. We control for these unobserved characteristics and we try to isolate the effect that changes in the unemployment rate could have on students' preferences to study one particular major over another. Standard errors are clustered at the degree level.

Although the job insecurity index is only reported for different degrees in 2006, it gives us an indication about the overall job-market prospects related to each field. Another, rather broader measure to examine economic conditions and employment quality is the unemployment rate. We examine the time variation of the uncertainty regarding the phase of the economy by looking at the effect of the annual unemployment rate on the demand for degrees in various fields and years.

5.2.2 Analysis of College Majors

In this section, we investigate the effect of the annual youth unemployment on the number of ordered applications submitted in each field with the following regression model:

$$Y_{d,f,c,t} = b_0 + b_1 Unemployment_t + b_2 FieldFE_f \times Unemployment_t + b_3 FieldFE_f + b_4 CampusCityFE_c + + b_5 UniversityFE_f + \epsilon_{d,f,c,t} \textbf{(2)}$$

where $Y_{i,f,c,t}$ indicates the number of applications a degree d, in field f, in city c, and year t attracted that reported it as top, second, third, and later choice.

The main coefficient of interest, estimated by standard OLS, is b_2 and measures the effect of youth unemployment on the popularity of each field relative to a benchmark field. Field fixed effects control for mean differences in the popularity of departments that offer degrees in different fields. A field is more popular than another when degrees in that field receive more applications that list them in higher positions in the preference list. We include campus-city and university fixed effects to control for unobserved time - invariant campus city- and university-related factors. Unemployment refers to annual unemployment in the country for people between the ages of 18 and 25 (youth unemployment), and is taken from World Bank statistical reports. The standard errors are clustered at the degree level.

One might worry about potential confounding factors that may have occurred during the recession, and that could affect the demand for higher education and for specific fields. As discussed in a previous section[17], there are no college costs (e.g. tuition and fees) that may alter students' preferences when unemployment rate is high. So students' ability to take out a loan, in this case, does not seem to be very relevant. However, one might worry that changes in the supply of degrees could happen during a recession, and might affect students' choices. We are able to net out supply effects by looking at students' preferences and not the actual outcomes of college applications. To control for possible changes in location that might occur, if, say, a specific university switches the campus-city where a degree course will be offered, we add in some specifications for both university and city campus fixed effects.

From a university perspective, we provide suggestive evidence that the number of existing university department providing degrees in each field does not change significantly (Table 2). Additionally, we believe that no considerable institutional changes within or across universities that may have occurred by 2011 that could affect the demand for higher education and/ or for specific fields. After all, any systematic differences across institutions that are constant over time are captured

[17]Section 4.3

by the university fixed effects and will not bias our estimate.

One might be concerned that the increase in the unemployment rate might coincide with professor salary cuts and significant drops in research funds that could threaten universities' quality. Any concerns about falling in academic standards and differences in university quality due to the recession are alleviated by the fact that our analysis stops in 2011, when harsh austerity measures had not yet been implemented. For robustness, we include a full set of university-specific, linear time trends to control for any unobserved factors that could change over time within universities. Another worry could be that some campus-city might experience a stronger deterioration in the services that they provide (entertainment, library closures, dorms, etc), and thus they might become less or more appealing to students after 2009. To address the concern that there could be campus-city trends in unobserved factors correlated with the unemployment rate, we add to the above regression model a full set of campus-specific, linear time trends.

5.3 University admission cut-offs

Degree cut-offs express students' valuations for the corresponding degrees. Table 10 provides a list with the ranking of fields based on their average cut-off values in the period 2005-2011. The factors determining the admission cut-offs are discussed in details in a previous section (Section 2.2). A higher demand for specific fields, as a result of the business cycle, might increase the admission cut-offs of related university departments. This would make admission to specific degree programs more difficult.

To investigate the effect of students' preferences over specific degrees on degrees' cut-off marks, we propose the following regression:

$$DegreeCutoff_{d,f,c,t} = b_0 + b_1 Numberof FirstChoiceApplications_{d,c,t} + b_9 Controls_{d,f,c,t} + b_3 FieldFE_f + b_7 YearFE_t + b_4 CityFE_c + b_5 UniversityFE_f + \epsilon_{d,f,c,t} \quad \textbf{(3)}$$

We regress the cut-off score of a degree d in field f in city c and year t on the number of applications submitted as students' first (but also second, third and later) choice as well as other controls. The main controls are some annual

variables, such as the proportion of females, the proportion of students from public or private schools, the aggregate supply of university seats, a measure for the easiness of the exam, a dummy if the tertiary academic institution is an academic university or a university of applied sciences (a technological educational institutes)[18] measure for the easiness of the exam.[19] To control for field, time, campus city and university unobserved heterogeneity we include field, time, campus city, and university fixed effects.

6 Main Results

Figure 4 displays the *proportion* of first-choice applications submitted for degree programs in each field averaged over all years in the sample. It shows that the largest percentage of college applicants aspire to study the field consisting of Education, Greek and Foreign Language departments and the smallest percentage Home Economics. Figure 5 shows the *weighted popularity index* of degree programs submitted as first choice in each field averaged over all years in the sample. The fields that receives the most first-choice applications given their supply over all years are Law and Psychology. The least number of first-choice applications are submitted to Agriculture and Forestry departments.

This analysis considers 22 major categories. Table 4 details good employment majors versus poor employment majors as indicated by the value of the degree insecurity index in 2006. The higher the job insecurity is, the worse the employment prospects are. The job insecurity index takes values from 1 to 1.5 for degrees that

[18]Technological educational institutes (or universities of applied sciences) offer undergraduate programs. They offer four-years degrees, and are recognised by the state. Twelfth-grade students who take national exams can report in their preference list degrees from both: academic universities and technological educational institutes. Since 2008 these institutions have offered postgraduate degree programs that lead to a master's degree.

[19]We calculate the average national exam performance of students who take the national exams each year. Assuming that cohorts are of similar academic quality across time, the only change from one year to another is the overall difficulty of the exam. If the overall performance in one year is greater than that of another year, then we assume that the exams were on average easier that year.

are characterized by " good employment prospects," 1.5 to 2 for " mediocre employment prospects," 2 to 2.5 for " poor employment prospects," and 2.5 to 3 for " very poor employment prospects." For example, for the enrolling cohort of 2006, studying Engineering and Computer Science offers better employment prospects than studying Agriculture and Forestry; a student embarking on a degree course in Social Political and European Studies faces worse employment prospects than a student studying Mathematics and Statistics.

6.1 Degree Preferences and Employment Prospects

Table 5 reports OLS results using equation (1) for the 2006 cohort. In Panel A, we regress the number of degree applications submitted as top, second and third option on a *degree* job insecurity index. The estimates are negative across specifications and statistically significant. When the job insecurity index of a specific degree increases by 1, then the related degree receives 62, 50 and 40 fewer applications listing it as the first, second and third option, respectively (columns 1, 4 and 7). For example, a degree that has good employment prospects (i.e. a degree in the department of Police and Military with job insecurity index=1.08) receives on average 62, 50 or 40 more first, second and third option applications than a degree that has poor employment prospects (i.e. a degree in the department of Journalism with job insecurity index=2.2). In columns 2, 3, 5, 6, 8 and 9 we add university, field and campus-city fixed effects to control for unobserved heterogeneity at the university, field and campus-city level. Our estimates remain negative and statistically significant. Changes in the degree job insecurity index affect more students' first choice preferences, as in it indicated by the higher in magnitude coefficients compared to their second and third choices.

In Panel B, we regress the number of degree applications submitted as top, second and third option on a *field* job insecurity index. We find that when the job insecurity index associated with a field increases by 1 (for example if biology's employment prospects change from good to mediocre), then the related degree receives 53, 44 and 33 fewer applications that list it as first, second and third

options respectively (columns 1,4 and 7). The inclusion of campus-city and university fixed effects in columns 2, 5, 8, and 3, 6, 9, respectively, hardly affects the results. Results from both panels support our hypothesis, that students react to changes in the economy and employment prospects related to specific degrees and fields. Students seem to prefer degrees and fields that include a low job insecurity index and imply better employment prospects.

6.2 Unemployment and Fields of Study

We then look at the effect of time-varying youth unemployment on the demand for specific fields of study while we look for the whole sample. Tables 6 and 7 report OLS estimates using equation (2). We find that a unit increase in youth unemployment increases the number of applications each degree receives by approximately 1 on average (Table 6). We examine the effect of the unemployment rate on the demand for degree applications submitted as first choice (Table 6, columns 1 and 2), second choice (Table 6, columns 3 and 4), third choice (Table 7, columns 1 and 2) and later choice (Table 7, columns 3 and 4). The omitted field here is Economics. So, the effect of unemployment on the popularity of each field is interpreted compared to Economics. We use economics as our benchmark major, because the changes in the Weighted Popularity Index of Economics degrees over the years are relatively small, as shown in Table 4.

To start with, a unit increase in youth unemployment causes an one unit decrease in the number of first-, second-, and third-choice applications each university department offering a Business and Management degree receives on average. On the other hand, a unit increase in unemployment induces the number of first-, second-, and third-choice applications to each university department offering a Psychology degree to rise by approximately 17, 11 and 11 respectively. The potential increase in the prevalence of depression and mental health during the financial crisis (Caroli and Godard, 2016; Cooper, 2011; McInerney et al., 2013; Uutela, 2010) may explain the rise in the popularity of Psychology degrees. Similarly, a unit increase in youth unemployment increases the number of top-,

second-, and third-choice applications each university department offering a Law degree receives by approximately 20, 13 and 10, respectively.

During the recession, there is an increase in students' reported top, second and third preference for destinations such as Military and Naval Academies and fields such as Mathematics and Statistics, Humanities and Liberal Art, Nursing, Veterinary Science, Pharmacy, Medicine, Psychology, Journalism, Biology, and Law. Conversely, Home Economics, Business and Management, Engineering and Computer Science fall in popularity during the crisis. Our findings are in parallel with job categorizations presented in Shatkin (2008)[20] who report that job opportunities in the Military and Health Care sectors are relatively less affected during economic turmoil. Furthermore, as he reports, the wage gap across sectors diminishes during a recession, and thus Humanities and Liberal Art jobs become more popular, as opposed to Engineering and Computer Science jobs. The construction industry suffers heavily during the recent recession, in Greece, as housebuilding, public infrastructure and major development projects stalled.

It's interesting to explicitly look at the effect of the unemployment rate on the popularity of degrees that guarantee an early source of income: degrees from Police, Military as well as Naval Academies.[21] Our findings show that a unit increase in youth unemployment causes a 2-, 3- and 4- units increase, respectively, in the number of top-, second-, and third-, choice applications each military academy receives on average. In addition, a unit increase in unemployment lead the num-

[20] Shatkin (2008) book "150 Best Recession-Proof Jobs" examines the most secure jobs for the U.S. market. Using databases of the U.S. Department of Labor and the U.S. Census Bureau, and occupational outlook ratings from the Bureau of Labor Statistics, which projects job growth and future job openings for more than 750 occupations, the author identified various jobs' sensitivity to changes in the economy and the projected outlook for jobs for the next 10 years. The author also lists the most recession-proof metropolitan areas and states, the most recession-proof skills, and the jobs that are very sensitive to recession.

[21] Naval academies are Military Academies. Their main responsibility is to educate and train competent Naval Officers for the Hellenic Navy. The academies also educate Deck and Engineering Naval cadets. They also educate Supply Officer cadets as well as Coast Guard Officer cadets.

ber of top and second choice applications each naval academy receives to rise by approximately 42 and 32 respectively. The military in Greece permits students to enlist and pursue tertiary education at the same time.[22] Individuals who join the armed forces sign an enlistment contract, binding them to service after graduation; in exchange, they immediately begin receiving a monthly stipend. In addition, immediately after completing their degrees at naval academies, graduates are guaranteed work serving on ships, and offered certain specialized training free of cost. Moreover, they have the opportunity to pursue high-paying careers as captains or engineers in commercial shipping. Greece's commercial shipping industry remained among the strongest in the world even during the recent recession, and therefore, employees of ship companies suffered few layoffs, and experienced low or no reductions in wages.

In Figure 6, we draw the percentage of college applications that listed military and police academies as their number-one choice over time (in the left panel). 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.

Our results in Tables 6 and 7 are fully aligned with the findings of Arcidiacono (2004) who suggests that college students tend to switch away from degrees that are relatively more challenging (i.e. engineering and computer science) when these degrees don't promise higher economic returns in comparison to other available degrees. Arcidiacono (2004) specifically mentions that fewer students choose to major in business or engineering, when no return premium is anticipated after graduation. We find that a unit increase in youth unemployment decreases the number of first-, second-, and third-choice applications each university engineering program receives by 0.4-0.5 on average.

We also report the effect of unemployment on the number of later-choice ap-

[22]Interested students include combined choices in their preference list. For example one may list "Economics major while in the armed forces". Both men and women can enlist in the armed forces.

plications[23] submitted to university departments. As we explained in a previous section (Section 2.2), college applications in Greece bear no cost. In a framework of cost-less applications, each individual has incentive to include every department in their preference list. Potentially, the only difference from one preference list to the next applicant's list is the ordering of the university departments. However, the direction of the effect of the unemployment rate on later choice applications indicated in columns (3) and (4) (Table 7) is not much different than before. For example, a unit increase in unemployment reduces later choice applications (outside top 3 applications) received by Agriculture and Forestry, and Business and Management departments by 18 and 20, respectively, or 28 and 16 respectively when university fixed effects are included. On the other hand, Police, Military and Naval Academies receive more later-choice applications when unemployment rises. As before, Law, Medicine, and Psychology departments become more popular when the overall uncertainty in the economy increases. Results remain almost unchanged when university fixed effects are included.

To make sure that our results for the effect of unemployment on the demand for different fields are not driven by university- or campus-city-specific time trends, that are correlated with the unemployment rate, we include a university- or campus-city-specific linear time trend. These robustness results are presented in Tables 8 and 9. Some coefficients slightly change while some others become statistically insignificant. A couple coefficients flip sign, but they become statistically insignificant. Overall, our results remain unchanged regarding which fields experience a drop or a rise in popularity when unemployment rises.

6.3 University Admission Thresholds

Then we look at the effect of students' reported college preferences on degrees' cut-off scores. If the supply of seats is constant over time, but competition for those seats grows, then the degree threshold score should increase. This happens

[23]Students' submitted applications outside their top-three choices. For example, students' top-four choice, top-five choice, ..., top N-choice.

because, for a given supply, the admission score of the last student admitted should be higher when there is more competition[24] over the seats. First, we rank the university fields based on the related degrees' threshold values over the sample period. Table 10 shows that dentistry is the field with the highest cut-off value for the period 2005-2011. This means that among all fields, the most difficult one for admission (the one with the highest cut-off threshold score), over the period of 7 years, is Dentistry. Second and third most difficult fields for university admission are Medicine and Pharmacy, respectively. Over the period of 7 years that is our sample period, naval academies rank low in terms of admission thresholds. But what is interesting is that, as the unemployment rate increases, Naval academies become more popular and possibly more difficult to enter.

Then in Table 11 we present OLS estimates for equation (3). Results suggest a positive relationship between the number of first-, second-, and third-choice applications and the degree-admission threshold. Columns 1-3, shows that for each additional first choice application a degree receives, the threshold score increases by 2,331 when only field fixed effects are included. This estimate drops to 1.381 when year fixed effects are included and becomes 1.519 when campus city and university fixed effects are included. The average degree cutoff in the sample is 12,084.91 (with a s.d of 4,506.325). This means that for each additional unit of unemployment, the threshold for Psychology departments will increase by approximately (17.005*1.519) 25.8, ceteris paribus. If the unemployment rate increases by one, then Medicine, Naval, and Mathematics and Statistics departments will experience a rise in their thresholds by around 15.3, 63 and 3.8 respectively, ceteris paribus. These numbers translate to 1 percent , 2.5 percent and 0.8 percent of the respective cut-off s.d. for degrees in medicine, Naval and, Mathematics and Statistics. For an additional second and third choice application a degree receives, the related degree admission threshold increases by 2.275 and 2.574 respectively, ceteris paribus.

[24]The only exception to this could be if the average academic quality of students applying to this specific degree drops on average. However, we have no reasons to believe that the average cohort academic quality varies by time.

In columns 10, 11 and 12 we examine if there is any effect on the admission threshold coming from later-choice applications. As we expected, there is a negative and statistically insignificant relationship between the number of later-choices applications and degree admission cut-offs. This might be the case because students list many degrees in low positions in the preference list as a risk aversion practice. Students might report degrees that cover a large range of cut-off values in order to make sure that they will be admitted to some university department even if this year's admission threshold drops significantly. Keep in mind that when students submit their degree applications, the actual degree admission thresholds are not determined or announced. Potentially, students have incentives to report all university departments in the field they aspire to study or potentially degrees from other fields too. Thus, intuitively the number of later-choice applications should not matter for degrees' threshold determinations.

7 Conclusions

This paper provides the first examination of switching college majors of study as a result of the financial crisis that began in Greece in 2009. We identify the relationship between youth unemployment and the demand for specific college degrees nationwide, while netting out supply-side dynamics. We focus primarily on the abrupt expansion of the Greek college application rate, and its fluctuation around the financial crisis. We document this expansion and develop a theory of the demand for post-secondary education that stresses the importance of short-run economic conditions in the decision-making of "marginal applicants." Finally, we advance a body of empirical evidence that supports a number of the inferences of the theory regarding the role of anticipated job prospects in educational decisions.

We use unique administrative data from Greece for all existing degree programs to study whether and how students' preferences and degree admission thresholds depend on degree-, and field-related employment prospects. Using panel data for the universe of degrees over a seven-year period, we find the following: First, we show that college applicants prefer degrees and majors with

lower job insecurity. Second, we find that changes in the unemployment rate have different effects on demand for different college majors. Indicatively, we find a decrease in the popularity of academically rigorous degrees in Engineering and Computer Science. We also document a decrease in the popularity of Business and Management, Journalism and Home Economics during the recession. During the crisis more people turn to Naval Academies, Police and Military Academies, which allow students to enlist and pursue tertiary education at the same time. Student in these degree programs are also guaranteed an early source of income that may begin with enrollment in the academy itself. For example, those who join the army sign an enlistment contract, binding them to serve after graduation, and then immediately begin receiving a monthly stipend. When the unemployment rate rises, we find an increase for the medical-related majors-such as Medicine, Pharmacy, Nursing and Dentistry that lead to high-paying medical employment. We also find an increase in the popularity of Psychology degrees. We speculate that the rise in the incidence of mental health issues during the recession may explain the increase in the popularity of Psychology degrees.

Third, we find that top choice-college applications influence degrees' admission thresholds, making enrollement in degrees with a low employment-insecurity index at the time of the recession more competitive. Our findings contribute to the understanding of workforce dynamics and occupational choice during economic downturns and can inform policies that fight unemployment. Understanding the flows of post-secondary education preferences during the recession might also help to a more optimal allocation of resources.

References

Arcidiacono, P. (2004). Ability Sorting and the Returns to College Major. *Journal of Econometrics 121*, 343–375.

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*.

Bedard, K. and D. A. Herman (2008). Who goes to Graduate/Professional School? the Importance of Economic Fluctuations, Undergraduate Field, and Ability. *Economics of Education Review. 27*, 197–210.

Beffy, M., D. Fougere, and A. Maurel (2011). Choosing the Field of Study in Post-secondary Education: Do Expected Earnings Matter? *Review of Economics and Statistics 94*, 334–347.

Braun, S., N. Dwenger, and D. Kubler (2010). Telling the Truth May Not Pay Off: An Empirical Study of Centralized University Admissions in Germany. *The B.E. Journal of Economic Analysis and Policy 10*(1), 1–38.

Caroli, E. and M. Godard (2016). Does Job Insecurity Deteriorate Health? *Health Economics 25*, 131–147.

Chen, Y. and O. Kesten (2013). From Boston to Chinese parallel to deferred acceptance: Theory and Experiments on a family of school choice mechanisms. *Discussion Papers, Research Unit: Market Behavior SP II 2013-205, Social Science Research Center Berlin (WZB)*.

Cooper, B. (2011). Economic Recession and Mental Health: An Overview. *Neuropsychiatr 25*(3), 113–117.

Cronin, J. M. and H. E. Horton (2009). Will Higher Education be the Next Bubble to Burst? *The Chronicle of Higher Education. 55*(7).

Dickson, L. (2010). Race and Gender Differences in College Major Choice. *The annals of the American Academy of Political and Social Science. 627*, 108–124.

Douglas, A. W. (2016). Are College Costs Worth it? How Ability, Major, and Debt affect the Returns to Schooling. *Economics of Education Review. 53*, 296–310.

Goulas, S. and R. Megalokonomou (2015). Social Interactions Through Space and Time: Evidence from College Enrollment and Academic Mobility. *Working Paper No. 65882, University Library of Munich*.

Hastings, J., C. Neilson, and S. Zimmerman (2014). Are Some Degrees Worth More Than Others? Evidence from College Admission Cutoffs in Chile. *National Bureau of Economic Research Working Paper No. 19241*.

Hershbein, B. J. (2012). Graduating High School in a Recession: Work, Education, and Home Production. *The BE Journal of Economic Analysis and Policy 12,*.

Johnson, M. (2013). The Impact of Business Cycle Fluctuations on Graduate School Enrollment. *Economics of Education Review. 34*, 122–134.

Joseph, A., E. Blom, and C. Meghir (2012). Heterogeneity in Human Capital Investments: High School Curriculum, College Major, and Careers. *Annual Review of Economics. 4*, 185–223.

Kahn, L. (2010). The Long-Term Labor Market Consequences of Graduating from College in a Bad Economy. *Labour Economics, Elsevier 17*(2), 303–316.

Katsikas, C. (2006). *Pós na epiléxo sostá tis spoudés mou sta AEI-TEI*. Athens, Greece: Patakis Publications Co.

McInerney, M., J. M. Mellor, and L. H. Nicholas (2013). Recession Depression: Mental Health Effects of the 2008 Stock Market Crash. *Journal of health economics 32*(6), 1090–1104.

Montmarquettea, C., K. Cannings, and S. Mahseredjianc (2002). How do Young People Choose College Majors? *Economics of Education Review. 21*, 543–556.

Nakata, Y. and C. Mosk (1987). The Demand for College Education in Postwar Japan. *Journal of Human Resources 75*, 377–404.

OECD (2016). Population with Tertiary Education (indicator). *doi: 10.1787/0b8f90e9-en, Accessed on: 15 November*.

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*(1), 1–29.

Porter, R. and P. Umbach (2006). College Major Choice: An Analysis of Person–Environment Fit. *Research in Higher Education 47*(4).

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

Uutela, A. (2010). Economic Crisis and Mental Health. *Current Opinion in Psychiatry 23*(2), 127–130.

Wee, S. L. (2013). Born Under a Bad Sign: The Cost of Entering the Job Market During a Recession. *University of Maryland mimeo*.

Wiswall, M. and B. Zafar (2011). Belief Updating Among College Students: Evidence from Experimental Variation in Information. *Federal Reserve Bank of New York. Staff Reports.* (516).

Table 1: Descriptive Statistics on college applicants

	Mean	**Std. Dev.**	**Min.**	**Max.**
If admitted	0.815	0.388	0	1
Number of applications	24.661	21.435	1	290
Rank of admitted college in preference list	8.041	9.981	1	238
Mobile students	0.699	0.458	0	1
Female	0.565	0.496	0	1
Age	17.98	1.139	15	66
Repeat	0.112	0.316	0	1
Cohort size	62,257	8,896	50,061	70,868
Aggregate Enrollment	60,257	6,799	52,450	69,631

Note: Data span seven cohorts from 2005 to 2011. Number of schools: 1403. Among those 442 high schools are in Athens or the surrounding suburbs. Mobile students are those who move to a different city in order to study.

Table 2: # UNIVERSITY DEPARTMENT OFFERING DEGREES IN VARIOUS FIELDS

	2005	2006	2007	2008	2009	2010	2011
Engineering and computer science	105	105	105	105	110	110	110
Agriculture and forestry	30	30	30	30	30	30	30
Economics	18	18	18	18	18	18	18
Mathematics and Statistics	11	11	11	11	11	11	11
Business and Management	67	67	67	67	70	70	70
Biology	6	6	6	6	6	6	6
Other	48	48	50	50	53	53	53
Physics and Earth Science	12	12	12	12	12	12	12
Liberal Arts and Humanities	22	23	23	23	23	23	23
Psychology	3	3	3	3	3	3	3
Social, Political and European Studies	12	12	12	12	13	13	13
Nursing and other Health	31	31	32	32	36	36	36
Journalism	5	5	5	5	5	5	5
Education, Language, History and P.E.	67	67	67	68	68	68	68
Home economics	1	1	1	1	1	1	1
Medicine	7	7	7	7	7	7	7
Pharmacy	3	3	3	3	3	3	3
Law	3	3	3	3	3	3	3
Veterinary Science	2	2	2	2	2	2	2
Dentistry	2	2	2	2	2	2	2
Police and Military	25	25	25	25	24	26	26
Naval Academies	2	2	2	2	2	2	2
Total # of available degrees	482	483	486	487	502	504	504
# of new high school graduates	70,560	68,067	53,552	52,430	50,061	70,868	69,545
# of college applicants	85,343	82,003	70,759	65,932	63,187	75,904	96,953

Note: The table shows the number of existing university departments in each field and year. The # of college applicants consists of the # of new high school graduates plus the # of students of returning applicants.

Table 3: Evolution of Weighted Popularity Index over time and fields

	2005	2006	2007	2008	2009	2010	2011
Engineering and computer science	194	164	127	115	103	122	149
Agriculture and forestry	73	45	32	31	30	49	58
Economics	181	167	163	152	147	163	185
Mathematics and Statistics	113	127	128	111	142	164	188
Business and Management	180	154	133	113	93	105	135
Biology	109	143	104	103	96	138	190
Other	92	68	46	45	37	70	68
Physics and Earth Science	102	100	95	97	103	120	136
Liberal Arts and Humanities	94	97	82	82	73	117	130
Psychology	419	510	443	378	312	525	791
Social, Political and European Studies	94	101	111	95	110	130	131
Nursing and other Health	147	184	134	129	108	203	208
Journalism	167	131	145	133	108	163	152
Education, Language, History and P.E.	230	262	240	238	228	225	304
Home economics	67	74	113	102	73	44	25
Medicine	298	287	249	261	274	222	527
Pharmacy	182	225	227	258	235	295	360
Law	871	1016	995	943	815	762	1470
Veterinary Science	95	98	82	80	70	126	177
Dentistry	289	278	249	267	269	265	346
Police and Military	290	298	277	227	261	280	343
Naval Academies	691	293	212	192	170	405	1226
Youth Unemployment (%)	25.3	24.8	22.5	22.0	25.5	32.4	44.1
Mean # applicants	174	169	145	135	125	149	188

Note: The table shows ratio between total number of college applications listing a university department in a particular field as their number one choice in some year over the number of existing university departments in that field in that year. Source of youth unemployment data: World Bank. Mean # applicants is the ratio of the total number of applicants over the number of existing university departments in a given year.

Table 4: College Majors and Respective Job Insecurity Index

Insecurity Index : >=1 and <1.5	>=1.5 and <=2	>2 and <=2.5	>2.5 and 3
Employment Prospects are:			
Good	**Mediocre**	**Poor**	**Very Poor**
Economics	Mathematics and Statistics	Education, Greek,	Agriculture and Forestry
Engineering and Computer science	Business and Management	Foreign languages and P.E.	Liberal Art and Humanities
Biology	Physics and Earth Science	Social Political and European Studies	Home Economics
Nursing and other Health	Psychology	Other	
Medicine	Law	Journalism	
Pharmacy			
Naval Academies			
Police and Military			
Veterinary Science			

Note: We derive a field-specific job insecurity index using the job insecurity index for each university department (degree). This measure is constructed using data from series of long-term questionnaire surveys of college graduates in Greece published in Katsikas (2006). This index refers to students who apply to university departments in year 2006.

Table 5: Effect of job insecurity on college applications in year 2006

Panel A: Effect of university-specific insecurity on demand for university degrees									
	Dependent Variable: Number of Degree Applications submitted as								
	Top Choice			Second Choice			Third Choice		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Degree Job Insecurity	-62.100	-55.587	-55.883	-50.562	-43.327	-44.262	-40.423	-32.594	-43.123
	(12.402)***	(13.452)***	(22.712)**	(8.261)***	(9.058)***	(13.325)***	(7.425)***	(8.464)***	(9.975)***
Campus city FE		✓	✓		✓	✓		✓	✓
Field FE			✓			✓			✓
University FE			✓			✓			✓
R^2	0.04	0.19	0.44	0.06	0.20	0.45	0.05	0.20	0.32
Observations	483	483	483	483	483	483	483	483	483
Panel B: Effect of field-specific insecurity on demand for university degrees									
	Dependent Variable: Number of Degree Applications submitted as								
	Top Choice			Second Choice			Third Choice		
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Field Job Insecurity	-53.449	-60.142	-57.496	-44.128	-39.023	-49.063	-33.087	-23.507	-41.610
	(20.510)***	(24.176)**	(17.601)***	(13.073)***	(15.838)**	(15.291)***	(10.727)***	(12.453)*	(14.594)***
Campus city FE		✓	✓		✓	✓		✓	✓
University FE			✓			✓			✓
R^2	0.01	0.17	0.33	0.02	0.18	0.29	0.01	0.18	0.28
Observations	483	483	483	483	483	483	483	483	483

Note: A constant is also included. Standard errors are clustered at the degree level. *,**,*** denotes significance at the 10%,5% and 1% level respectively.

Table 6: The effect of unemployment on first and second choice applications

	Top Choice		Second Choice	
	(1)	(2)	(3)	(4)
Unemployment	1.053	0.656	1.311	1.146
	(0.000)***	(0.293)**	(0.000)***	(0.220)***
Unemployment × Computer Science and Engineering	-0.448	-0.008	-0.623	-0.494
	(0.041)***	(0.257)	(0.037)***	(0.231)**
Unemployment × Agriculture and Forestry	-0.135	0.502	-0.498	-0.014
	(0.000)***	(0534)	(0.000)***	(0.361)
Unemployment × Mathematics and Statistics	2.274	2.671	1.776	1.940
	(0.000)***	(0.393)***	(0.000)***	(0.219)***
Unemployment × Business and Management	-1.069	-0.477	-1.393	-1.180
	(0.055)***	(0.395)	(0.027)***	(0.268)***
Unemployment × Biology	2.762	3.159	2.216	2.379
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Other	-0.341	0.922	-0.323	0.184
	(0.020)***	(0.313)**	(0.024)***	(0.237)
Unemployment × Physics and Earth Science	0.830	1.057	0.600	0.788
	(0.000)***	(0.308)***	(0.000)***	(0.221)***
Unemployment × Liberal Arts and Humanities	1.263	1.565	0.859	0.989
	(0.005)***	(0.323)***	(0.006)***	(0.243)***
Unemployment × Psychology	16.608	17.005	11.428	11.591
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Social, Political and European Studies	1.332	1.810	1.127	1.060
	(0.289)***	(0.450)***	(0.038)***	(0.249)***
Unemployment × Nursing and other health	3.171	3.397	2.788	2.777
	(0.084)***	(0.314)***	(0.565)***	(0.246)***
Unemployment × Journalism	-0.107	0.290	0.827	0.990
	(0.000)***	(0.293)	(0.000)***	(0.220)***
Unemployment × Education, Language, History and P.E.	1.494	1.692	0.648	0.745
	(0.009)***	(0.316)***	(0.007)***	(0.233)***
Unemployment × Home Economics	-4.527	-4.130	-3.126	-2.963
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Medicine	9.632	10.028	6.827	6.990
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Pharmacy	5.330	5.727	2.945	3.109
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Law	19.737	20.134	13.088	13.251
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Veterinary Science	3.439	3.836	3.243	3.406
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Dentistry	2.337	2.734	2.663	2.827
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Unemployment × Police & Military	2.355	2.925	3.623	3.891
	(0.000)***	(0.293)***	(0.026)***	(0.220)***
Unemployment × Naval Academies	41.531	41.928	32.698	32.861
	(0.000)***	(0.293)***	(0.000)***	(0.220)***
Fields and Campus F.E.	✓	✓	✓	✓
University F.E.		✓		✓
R^2	0.32	0.42	0.37	0.45

Note: An intercept is included. Number of observations: 3,448 degrees. 43 universities are used. Economics is used as the benchmark field. Standard error are clustered at the field level.

Table 7: The effect of unemployment on third and later choice applications

	Third Choice		Outside Top3 Choice	
	(1)	(2)	(3)	(4)
Unemployment	1.396	1.279	16.967	12.753
	(0.000)***	(0.291)**	(0.000)***	(4.021)**
Unemployment × Computer Science and Engineering	-0.555	-0.413	19.317	21.381
	(0.000)***	(0.296)	(0.471)***	(4.021)**
Unemployment × Agriculture and Forestry	-0.450	-0.029	-18.800	-28.315
	(0.000)***	(0.416)	(0.000)***	(9.950)**
Unemployment × Mathematics and Statistics	1.249	1.366	13.522	17.736
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Business and Management	-1.359	-1.197	-20.030	-16.442
	(0.101)***	(0.278)***	(0.948)***	(5.127)***
Unemployment × Biology	2.077	2.194	67.383	71.596
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Other	-0.406	-0.306	23.332	23.746
	(0.018)***	(0.349)	(0.639)***	(5.225)***
Unemployment × Physics and Earth Science	0.912	1.017	10.221	8.841
	(0.000)***	(0.319)**	(0.000)***	(4.616)*
Unemployment × Liberal Arts and Humanities	0.649	0.662	41.517	49.244
	(0.004)***	(0.338)*	(0.766)***	(4.426)***
Unemployment × Psychology	11.333	11.450	36.944	41.158
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Social, Political and European Studies	0.980	1.053	64.637	71.129
	(0.517)***	(0.496)**	(0.981)***	(3.484)***
Unemployment × Nursing and other health	3.528	3.545	151.288	158.163
	(0.053)***	(0.298)***	(1.182)***	(3.883)***
Unemployment × Journalism	0.783	0.900	102.023	106.237
	(0.517)***	(0.291)**	(0.000)***	(4.021)***
Unemployment × Education, Language, History and P.E.	0.167	0.275	21.793	23.937
	(0.008)***	(0.308)	(0.142)***	(4.976)***
Unemployment × Home Economics	-3.167	-3.050	-34.510	-30.296
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Medicine	6.488	6.604	35.548	39.762
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Pharmacy	2.624	2.741	53.548	58.049
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Law	9.949	10.066	16.729	20.942
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Unemployment × Veterinary Science	0.478	0.594	30.461	34.675
	(0.000)***	(0.291)*	(0.000)***	(4.021)***
Unemployment × Dentistry	0.291	0.408	43.496	47.710
	(0.000)***	(0.291)	(0.000)***	(4.021)***
Unemployment × Police & Military	3.684	3.903	8.794	13.408
	(0.024)***	(0.291)***	(0.214)***	(4.021)***
Unemployment × Naval Academies	5.336	5.452	57.544	61.759
	(0.000)***	(0.291)***	(0.000)***	(4.021)***
Fields and Campus F.E.	✓	✓	✓	✓
University F.E.		✓		✓
R^2	0.32	0.39	0.37	0.43

Note: An intercept is included. Number of observations: 3,448 degrees. 43 universities are used. Economics is used as the benchmark field. Standard error are clustered at the field level.

Table 8: Robustness checks: Campus and University Linear Time Trends

	Top Choice		Second Choice	
	(1)	(2)	(3)	(4)
Unemployment	3.167	3.162	2.968	2.670
	(0.530)***	(0.380)***	(0.469)***	(0.329)***
Unemployment × Computer Science and Engineering	-0.235	-0.028	-0.078	0.266
	(0.127)*	(0.405)	(0.124)	(0.352)
Unemployment × Agriculture and Forestry	0.091	-0.692	0.058	0.044
	(0.138)	(0.404)	(0.146)	(0.333)
Unemployment × Mathematics and Statistics	2.423	2.194	1.825	1.686
	(0.230)***	(0.316)***	(0.109)***	(0.247)***
Unemployment × Business and Management	-0.479	-0.092	-0.600	0.174
	(0.093)***	(0.404)	(0.094)***	(0.377)
Unemployment × Biology	2.912	1.789	2.811	2.151
	(0.211)***	(0.321)***	(0.140)***	(0.288)***
Unemployment × Physics and Earth Science	0.791	-0.172	0.646	0.379
	(0.174)***	(0.356)	(0.141)***	(0.370)
Unemployment × Liberal Arts and Humanities	1.173	0.527	0.932	0.715
	(0.128)***	(0.559)	(0.113)***	(0.422)*
Unemployment × Psychology	16.255	15.653	11.093	10.884
	(0.317)***	(0.427)***	(0.285)***	(0.316)***
Unemployment × Social, Political and European Studies	1.516	0.063	1.067	0.455
	(0.341)***	(0.501)	(0.135)***	(0.284)
Unemployment × Nursing and other health	3.485	3.844	3.158	3.885
	(0.175)***	(0.677)***	(0.125)***	(0.532)***
Unemployment × Journalism	0.832	-0.133	1.586	1.290
	(0.149)***	(0.363)	(0.292)***	(0.188)***
Unemployment × Education, Language, History and P.E.	1.331	0.796	0.459	0.528
	(0.062)***	(0.400)*	(0.040)***	(0.326)***
Unemployment × Home Economics	-3.056	-5.456	-2.356	-2.667
	(0.379)***	(0.500)***	(0.197)***	(0.272)***
Unemployment × Medicine	9.545	8.604	6.985	6.422
	(0.221)***	(0.332)***	(0.112)***	(0.336)***
Unemployment × Pharmacy	5.278	4.280	3.330	3.090
	(0.184)***	(0.446)***	(0.231)***	(0.389)***
Unemployment × Law	19.369	18.829	12.519	12.962
	(0.287)***	(0.405)***	(0.190)***	(0.427)***
Unemployment × Veterinary Science	3.264	2.058	3.470	3.114
	(0.279)***	(0.458)***	(0.401)***	(0.277)***
Unemployment × Dentistry	2.426	1.131	2.948	2.468
	(0.280)***	(0.556)*	(0.224)***	(0.458)***
Unemployment × Police & Military	2.524	4.344	3.995	3.624
	(0.250)***	(1.317)***	(0.218)***	(1.059)***
Unemployment × Naval Academies	43.002	46.221	33.470	36.633
	(0.379)***	(5.740)***	(0.197)***	(4.402)***
Fields and Campus F.E.	✓		✓	
Campus City Specific Linear Time Trend	✓		✓	
Fields and University F.E.		✓		✓
University Specific Linear Time Trend		✓		✓

Note: An intercept is included. Number of observations: 3,448 degrees. 43 universities are used. Economics is used as the benchmark field. Standard errors are clustered at the field level. Estimates for the category "Other" are not reported due to space constraints.

Table 9: Robustness checks: Campus and University Linear Time Trends

	Third Choice		Later Choice	
	(1)	(2)	(3)	(4)
Unemployment	3.193	2.863	77.767	70.927
	(0.513)***	(0.400)***	(14.843)***	(11.193)***
Unemployment × Computer Science and Engineering	-0.069	0.375	47.502	60.028
	(0.185)	(0.263)	(4.079)***	(10.068)**
Unemployment × Agriculture and Forestry	-0.068	0.215	-33.412	20.013
	(0.256)	(0.271)	(12.214)**	(16.510)
Unemployment × Mathematics and Statistics	1.185	1.188	21.168	13.399
	(0.204)***	(0.255)***	(5.558)***	(2.718)***
Unemployment × Business and Management	-0.771	0.150	-18.508	44.460
	(0.250)**	(0.348)	(6.319)**	(14.483)***
Unemployment × Biology	2.426	1.934	89.124	60.478
	(0.220)***	(0.303)***	(9.448)***	(3.597)***
Unemployment × Physics and Earth Science	0.914	0.672	25.942	11.569
	(0.212)***	(0.296)**	(5.768)***	(3.865)***
Unemployment × Liberal Arts and Humanities	0.693	0.444	53.401	47.560
	(0.121)***	(0.286)	(5.420)***	(3.497)***
Unemployment × Psychology	10.934	10.856	36.793	28.802
	(0.262)***	(0.366)***	(3.937)***	(4.257)***
Unemployment × Social, Political and European Studies	0.826	0.736	66.034	62.470
	(0.534)	(0.274)**	(4.134)***	(3.953)***
Unemployment × Nursing and other health	3.765	4.738	169.704	215.079
	(0.219)***	(0.422)***	(6.471)***	(22.207)***
Unemployment × Journalism	1.282	1.251	130.280	125.705
	(0.588)**	(0.228)***	(27.812)***	(8.478)***
Unemployment × Education, Language, History and P.E.	0.017	0.217	25.934	21.384
	(0.071)	(0.281)	(3.443)***	(3.579)***
Unemployment × Home Economics	-2.692	-2.484	-22.857	-5.632
	(0.248)***	(0.443)***	(3.210)***	(10.867)
Unemployment × Medicine	6.523	6.094	49.985	26.719
	(0.244)***	(0.341)***	(8.929)***	(4.085)***
Unemployment × Pharmacy	2.926	2.615	61.664	51.164
	(0.211)***	(0.370)***	(4.245)***	(3.982)***
Unemployment × Law	9.649	9.773	8.038	7.798
	(0.424)***	(0.542)***	(3.165)***	(3.965)***
Unemployment × Veterinary Science	0.911	0.305	75.797	23.881
	(0.426)**	(0.273)	(29.541)***	(5.302)***
Unemployment × Dentistry	0.476	-0.002	49.951	38.173
	(0.162)***	(0.527)	(3.845)***	(4.844)***
Unemployment × Police & Military	4.081	2.325	12.506	-36.243
	(0.272)***	(0.408)***	(3.994)***	(11.149)***
Unemployment × Naval Academies	5.811	5.242	69.198	19.772
	(0.248)***	(0.684)***	(3.210)***	(18.507)
Fields and Campus F.E.	✓		✓	
Campus City Linear Time Trend	✓		✓	
Fields and University F.E.		✓		✓
University Linear Time Trend		✓		✓

Note: An intercept is included. Number of observations: 3,448 degrees. 43 universities are used. Economics is used as the benchmark field. Standard errors are clustered at the field level. Estimates for the category "Other" are not reported due to space constraints.

Table 10: Ranking of fields based on threshold scores

Field	**Threshold**	**Rank**
Dentistry	17,816	1
Medicine	17,563	2
Pharmacy	16,706	3
Military and police	16,601	4
Veterinary Science	16,157	5
Law	16,058	6
Psychology	15,493	7
Home Economics	14,659	8
Biology	14,437	9
Mathematics and Statistics	13,119	10
Education,Language, History and P.E	12,937	11
Engineering and Computer Science	12,510	12
Physics and Earth Science	12,442	13
Social,Political and European Studies	12,162	14
Journalism	11,899	15
Economics	11,813	16
Nursing and Other Health	11,442	17
Liberal Art and Humanities	11,358	18
Business and Management	10,571	19
Other	10,372	10
Agriculture and Forestry	9,165	21
Naval Academies	7,851	22

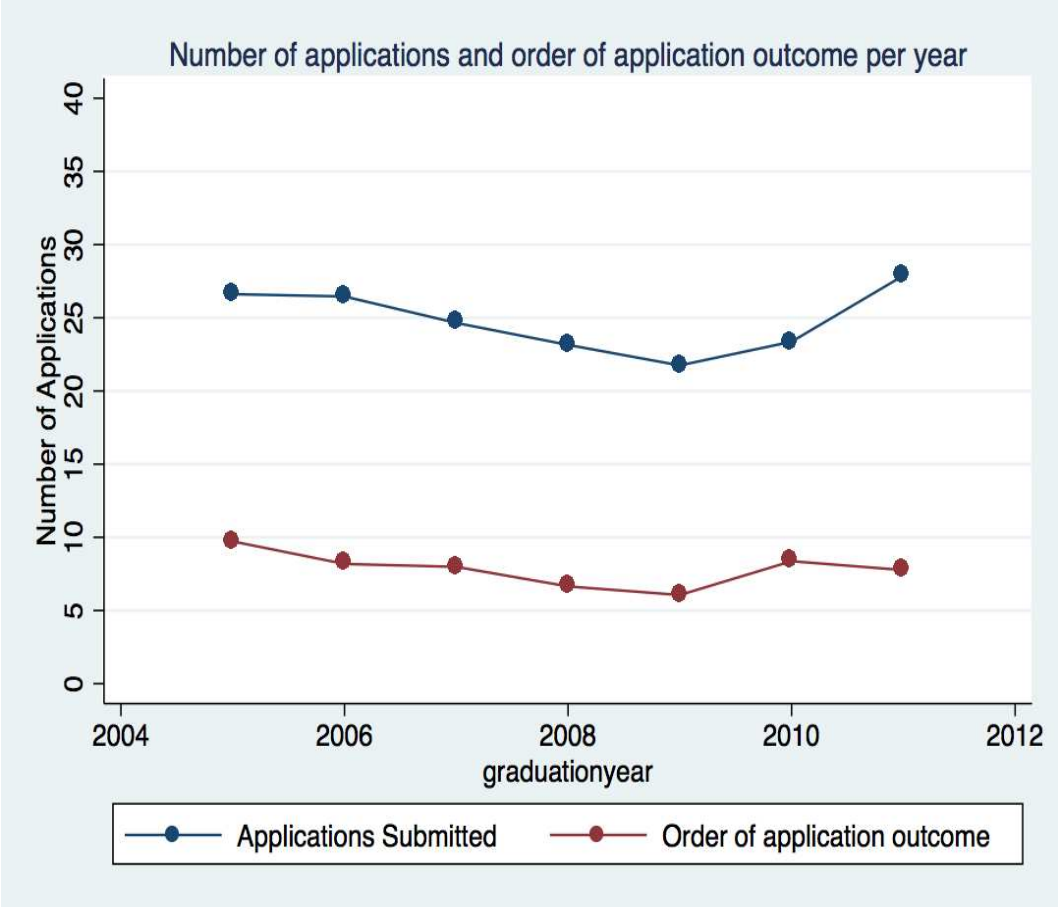
Note: The "threshold score" or the "cut-off score" for admission for most university departments varies from 0 to 20,000. The higher the threshold value is, the more difficult it is for a student to gain admission. Some university departments require students to take exams in "special subjects" (for example some Architecture departments require students to take an exam in architectural design) and the maximum threshold value for these degrees could exceed 20,000.

Table 11: The effect of the demand for degrees on the degree cut-off scores

	Dependent Variable: Degree Cut-off score											
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Number of:												
First choice Applications	2.331	1.381	1.519									
	(0.394)***	(0.366)***	(0.343)***									
Second choice Applications				3.518	2.035	2.275						
				(0.699)***	(0.695)***	(0.645)***						
Third choice Applications							3.607	2.527	2.574			
							(0.564)***	(0.527)***	(0.548)***			
Later choice Applications										-0.016	-0.031	-0.028
										(0.048)	(0.047)	(0.044)
Aggregate supply of seats	-0.030			-0.011			-0.011			-0.007		
	(0.006)***			(0.006)*			(0.006)*			(0.006)		
Easiness of the exam	3.152			3.070			3.067			3.175		
	(0.333)***			(0.331)***			(0.326)***			(0.335)***		
Field FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year FE		✓	✓		✓	✓		✓	✓		✓	✓
Campus city FE		✓	✓		✓	✓		✓	✓		✓	✓
University FE			✓			✓			✓			✓
Observations	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746	2,746

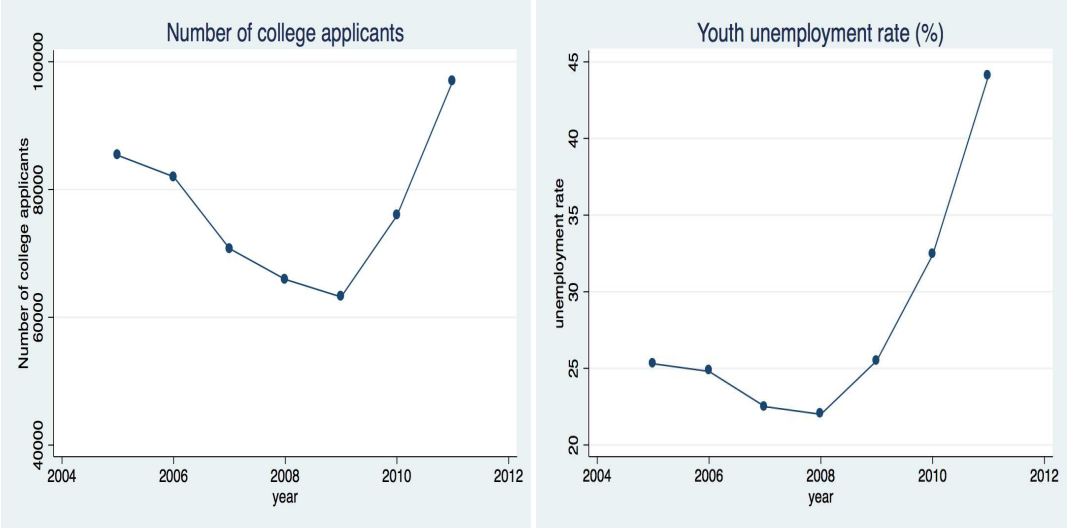
Note: A constant is also included. Standard errors are clustered at the degree level. *,**,*** denotes significance at the 10%,5% and 1% level respectively. In columns (1), (4), (7) and (10), we also control for the annual percentage of girls, annual percentage of students attending a public school/private and experimental school, a dummy if the tertiary institution is an academic university or a technical academy and the annual percentage of students attending an urban school. The average degree cut-off in the sample is 12,084.91 (with a s.d of 4,506.325).

Figure 1: Number of applications and order of the unique application outcome per year



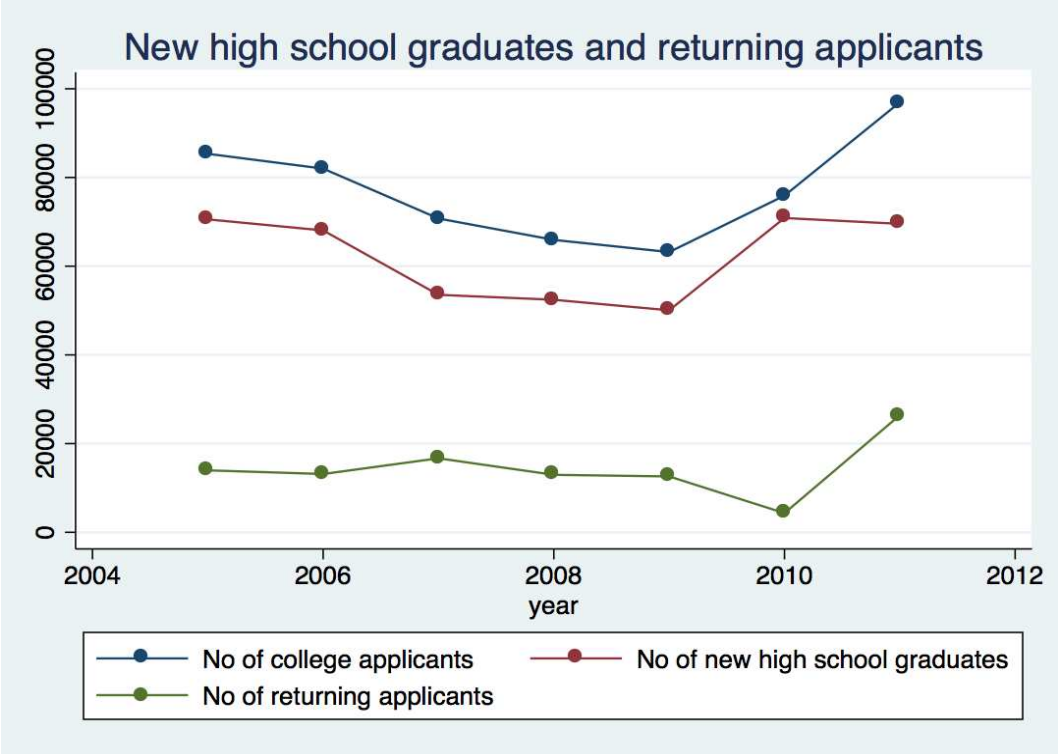
This figure shows the number of degrees students report in their preference lists on average. These reported degrees are equivalent to degree applications. Students compile a list with any degree offered in the country they would like to be admitted to. This figure also shows the order of the unique degree (application outcome) students are accepted.

Figure 2: Number of total college applicants and youth unemployment over time



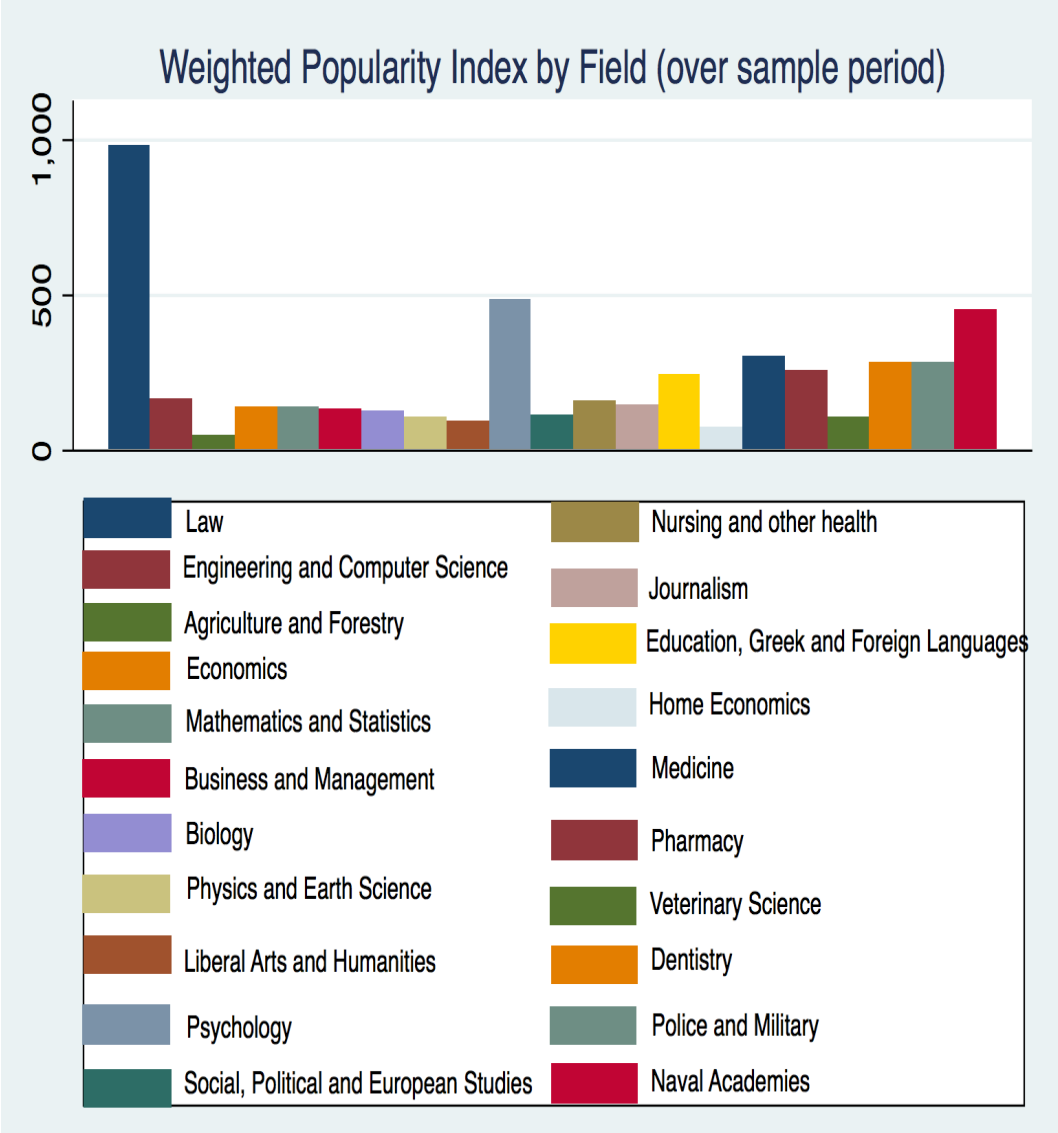
The left figure shows the number of college applicants over time and the right figure shows the evolution of the youth unemployment rate over time. Sample period: 2005-2011. Source for unemployment data: World Bank.

Figure 3: Number of total college applicants separated into new high school graduates and returning applicants



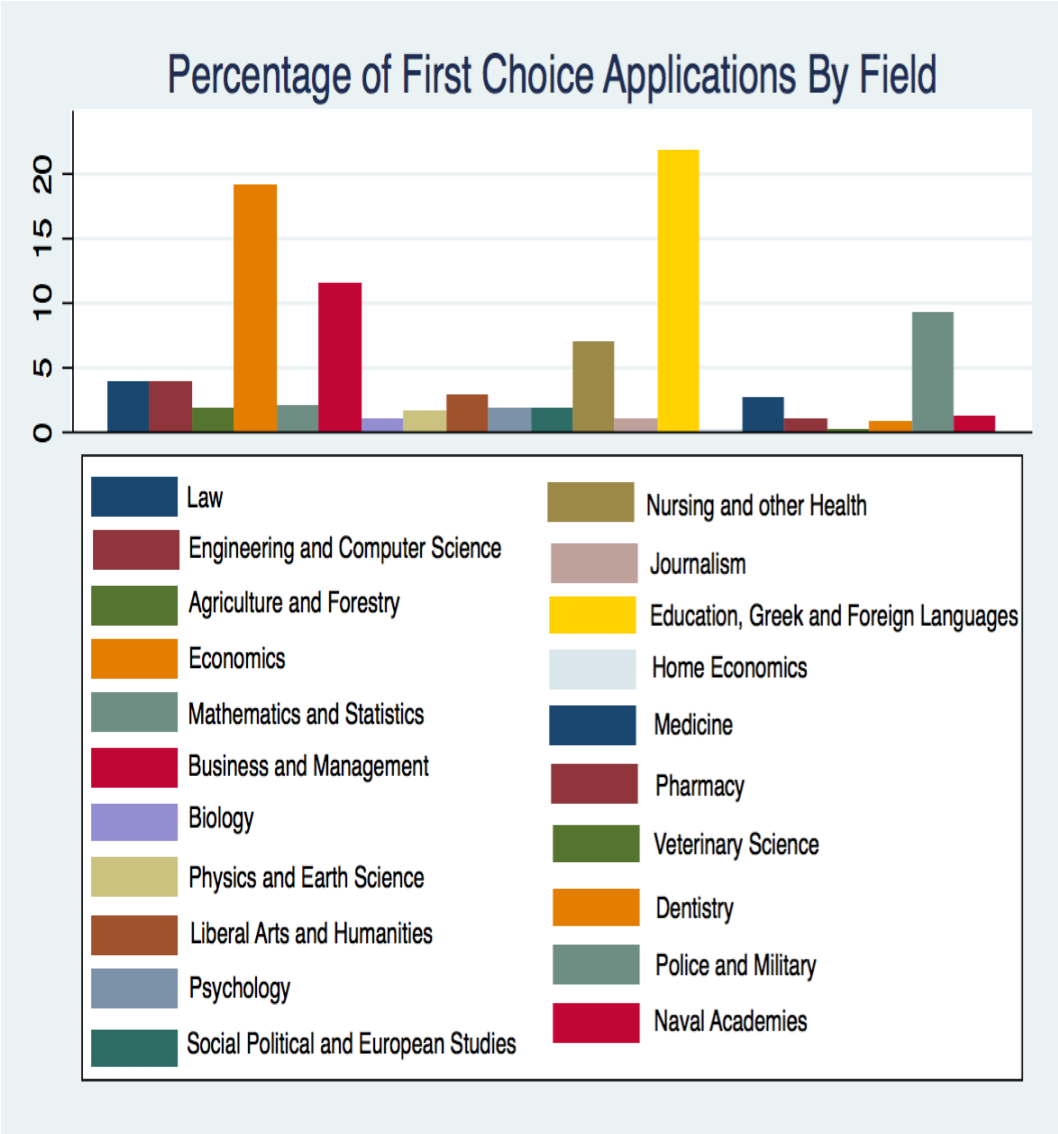
This figure shows: a) The total number of college applicants, b) The number of new-high school graduates (who who graduate from high school the year they apply to college) and c) The number of returning students (those who had graduated in a previous year and they reapply for college admission).

Figure 4: Number of applications submitted as top choices per field



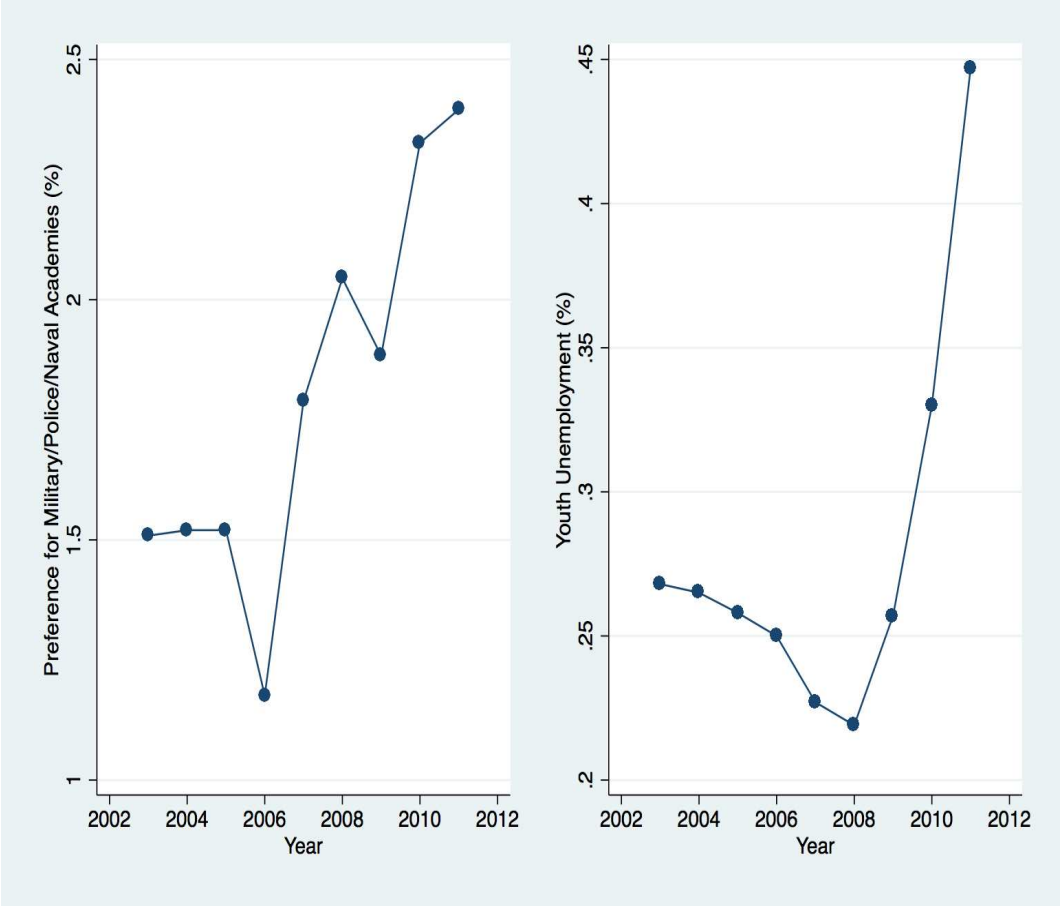
This figure shows the numbers of first choice applications submitted to degrees in each field. These numbers are averaged over all years in the sample.

Figure 5: Percentage of applications submitted as top choices per field



This figure shows the percentage of students who submitted a first choice application to degrees in each field. These percentages are calculated using all years in the sample.

Figure 6: Preference for Military/ Police/ Naval Academies and Youth Unemployment



The left figure depicts the percentage of college applicants per year that listed military or police or naval related majors as their most preferred choice. The right figure shows annual youth unemployment rate (%). Source for unemployment data: World Bank.