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## Exposure to academic fields and college major choice

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## ABSTRACT

This study investigates how exposure to a field of study influences students' major choices. If students have incomplete information, exposure potentially helps them to learn about the scope of a field as well as how well the field matches their interest and abilities. We exploit a natural experiment where university students have to write a research paper in business, economics, or law during their first year before they choose a major. Due to oversubscription of business papers, the field of the paper is assigned quasi-randomly. We find that writing in economics raises the probability of majoring in economics by 2.7 percentage points. We show further that this effect varies across subfields: the effect is driven by assignment to topics less typical of the public's perception of the field of economics, suggesting students learn through exposure that the field is broader than they thought.

## 1. Introduction

A college student's choice of major has a large impact on her post-graduation labor market outcomes.<sup>1</sup> Indeed, wage differences between some majors are as big as the wage gap between college and high school graduates (Altonji, Blom, & Meghir, 2012). In addition to economic considerations, recent studies suggest that students choose their field of study according to their tastes and abilities (Altonji, Arcidiacono, & Maurel, 2016).<sup>2</sup> These individual characteristics determine how much students enjoy their coursework and how much time and effort they invest towards their degree.

When students start college, they have imperfect knowledge about potential fields of study as well as their tastes and abilities. Their coursework exposes them to different fields of study, which potentially helps them learn about their preferences and capabilities. Such learning, and the superior matching that arguably results between a student and her major, provide one justification for late academic specialization, such as that which takes place in US and Canadian universities (Bordon and Fu, 2015; Malamud, 2010, 2011).

As important as it may be, the link between exposure to different fields and the student's choice of major has been largely unstudied. One reason for this may be that students self-select their coursework, that is, students choose classes in fields that they think will interest them. As a result, using course selection to estimate the effect of exposure could overstate its importance. In this paper, we exploit quasi-random exposure to different fields of study to analyze how exposure affects a student's choice of major.

To do so we exploit a natural experiment at a Swiss university. The University of St. Gallen (USG) is one of Europe's leading business schools.<sup>3</sup> Two institutional features make the USG an excellent place to study the effects of exposure on major choice. First, as in many US universities, students choose their major only after the first year. Second, the institutional setting introduces an element of quasi-random exposure to different fields during the first year. The USG offers undergraduate studies in the fields of Business, Economics, Law, Law and Economics, and International Affairs. Coursework for first-year students is almost identical irrespective of the student's intended major. However, in addition to coursework, the first-year curriculum involves a

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<sup>1</sup> See Arcidiacono (2004), Grogger and Eide (1995), Hamermesh and Donald (2008), James, Alsalam, Conaty, and To (1989) and Kirkeboen, Leuven, and Mogstad (2016).

<sup>2</sup> Literature outside economics focuses on the role of aptitudes (i.e., major-specific skills and abilities), tastes, and preferences (e.g. Malgwi, Howe, & Burnaby, 2005). More recently, also the economics literature has started devoting more attention to these dimensions of the major decision. See Altonji (1993), Arcidiacono, Hotz, and Kang (2012), Montmarquette, Cannings, and Mahseredjian (2002), Stinebrickner and Stinebrickner (2014), Zafar (2011, 2013) and Wiswall and Zafar (2016).

<sup>3</sup> For example, the Financial Times ranked the University of St. Gallen 4th in the European Business School Ranking in 2015.

substantial first-year paper. Each student must write a paper in one of the three core fields: business, economics, or law. Students may state their preferences over fields, but because business papers are oversubscribed, students do not necessarily receive their preferred choice. To deal with the oversubscription problem, the university assigns the field of the first-year paper in a standardized way that is unrelated to student characteristics. This allows us to identify the effect of exposure to economics and law on subsequent major choice and on other student outcomes.

Among students whose preferred field is business, we find that being assigned to write a paper in economics increases the probability of majoring in economics by 2.7 percentage points. This is equal to 17.6% of the share of students who major in economics. Being assigned to write a law paper increases the probability of studying law by 1.6 percentage points. Furthermore, we find that being assigned to economics positively influences grades in introductory economic courses. We also investigate heterogeneity in this effect with respect to topics. We find that the effect of being assigned to write in economics is driven by students who are assigned to topics that may lie beyond the public's general perception of the field. This suggests that exposure provides new information to students about the scope of the discipline.

In a broader sense, our study relates to the policy discussions about major choices. For instance, a policy objective in the United States is to guide students towards STEM majors.<sup>4</sup> [Stinebrickner and Stinebrickner \(2014\)](#) argue that greater exposure, by means of additional science courses, might lead to more science graduates. If one can extrapolate from economics to STEM, our results suggest that such a policy might be worth exploring.

A few recent studies suggest that students' major choices are affected by coursework. [Joensen and Nielsen \(2016\)](#) provide evidence that a combination of high school math and chemistry increases women's participation in science. [Zafar \(2011\)](#) and [Stinebrickner and Stinebrickner \(2014\)](#) find that learning has not only a major-specific component but also a general component: by learning about their abilities or interests with respect to their pursued major, students also receive information about non-pursued majors.<sup>5</sup> However, in these two studies, students decide on their coursework, which in turn determines the fields about which students receive new information. That is, exposure to fields might be partly driven by unobserved tastes directly related to major choice. [Wiswall and Zafar \(Wiswall & Zafar, 2015\)](#) show that such tastes play an important role in students' major choices. An important advantage of our approach is that the institutional setting at USG allows us to study exogenous exposure that is unrelated to students' characteristics.<sup>6</sup>

The remainder of the paper is structured as follows. [Section 2](#) introduces the institutional setting at USG and the assignment mechanism. [Section 3](#) describes the administrative data and provides descriptive statistics. [Section 4](#) explains the empirical framework. [Section 5](#) presents the results and robustness checks. [Section 6](#) concludes.

## 2. Institutional setting

### 2.1. General background

USG is one of twelve public universities in Switzerland. All undergraduates declare a major at the end of their first year. [Table 1](#) shows

**Table 1**  
Major declarations by field.

Major	% enrolled in major
Business	61.7
Economics	15.3
Law	5.4
International Affairs	13.7
Law & Economics	7.7

*Note:* Distribution of majors of students who completed the first year in the first attempt. Shares don't add up to 100% as some students are enrolled in two majors.

that over three-fifths of the students enroll in business.<sup>7</sup>

The first-year curriculum is almost identical for all students.<sup>8</sup> Coursework includes one class each semester in each of the three core fields of business, economics, and law. These are large lectures that seat all first-year students at the same time. Students are also organized into discussion sections. Each discussion section consists of around 35 students and three teaching assistants, one in each core field. Discussion sections meet once a week on Fridays; the field that is covered in section rotates on a week-to-week basis.<sup>9</sup> Students are assigned to their section for the entire first year, but teaching assistants may change in the second semester.

Besides coursework, a key part of the first-year curriculum is the first-year paper, which addresses a topic in one of the three core fields. Students receive 5 credits for the first-year paper out of 60 credits in the first year. This number corresponds roughly to the number of credits for an exam in one of the core fields (5.5 credits). The first-year paper is intended to provide students with an introduction to academic writing. It is supervised by one of the teaching assistants from the student's discussion section. The supervising teaching assistant sets the paper topic, supervises the student's work, and grades the paper. Teaching assistants are relatively free to assign specific topics within their field. [Appendix 3](#) provides a sample list of topics from the three fields and information on the requirements and assessment criteria.

### 2.2. Assignment of the paper field

The process used to assign students to the paper field is linked to the process used to assign students to discussion sections. Students bid for discussion sections using points allocated by the university during an orientation week that takes place immediately before the first semester starts. Students' preferences are strongly related to the section's meeting time since all discussion sections meet on Fridays. Most students place their bids after receiving information on the bidding process during the orientation week. During the orientation week a tutor explains the complex bidding process and students then place their bids together in a computer lab. In theory, students could place their bids before the orientation week. However, the university discourages students from doing so and suggests that they wait until the orientation week in a welcome letter. The administration as well as the IT department confirmed to us that the vast majority of students place their bid within a few days during the orientation week. Assignment to discussion sections then takes place at the end of the week.

Students are then assigned to the field of their paper by means of a process that incorporates information about their discussion section.

<sup>7</sup> After the first year, the mandatory course work of the different majors hardly overlaps. For instance, out of a 120 credits, business students have to take 8 credits in economics and economics students have to take 10 credits in business.

<sup>8</sup> The course work may vary for three reasons. First, students who intend to study law can enter a specific law track. Instead of math, it includes two additional law courses in the first year. Second, students have to choose a course in History or Philosophy, and a course in Psychology or Sociology. Third, students are required to take a foreign language. Students choose these courses at the beginning of the first year.

<sup>9</sup> See [Appendix 2](#) for a simplified Friday schedule for different sections.

<sup>4</sup> For an overview of the discussion see [Bettinger \(2010\)](#).

<sup>5</sup> [Avery, Gurantz, Hurwitz, and Smith \(2017\)](#) show that students are more likely to major in a certain field after receiving a high score in a corresponding Advanced Placement exam using a regression discontinuity design. The authors attribute this effect at least in part to a positive signal about students' match quality.

<sup>6</sup> A related strand of literature suggests that exposure to majors or occupations of family members' also influences student choices. See [Black and Devereux \(2011\)](#) for parents and [Xia \(2016\)](#) for siblings.

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