# Gaining the (Over)Confidence to Start your Business

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**Abstract**

We demonstrate entrepreneurial overconfidence is not a fixed trait, but instead shaped by social interactions. In our setting, randomized connections to peers with high entrepreneurial confidence increase the likelihood young managers also become entrepreneurs, especially women with lower confidence prior to treatment. By surveying treated individuals, we confirm managers gain interest in entrepreneurship through increased confidence. We reject alternative explanations including access to entrepreneurial knowledge and decreased risk aversion. Our results also suggest shocks to confidence may increase participation in entrepreneurial training programs. Overall, we offer the first experimental evidence that peers increase entrepreneurship and relate these variables through (over)confidence.

**JEL Classification:** L26, D81, D84, D91, C92

**Keywords:** Entrepreneurship, Overconfidence, Peer Effects, Random Assignment, Entrepreneurial Gender Gap

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# 1 Introduction

Innovative entrepreneurs have the potential to dramatically enhance the productivity of firms and, consequentially, economic growth (Aghion et al., 1998; Baumol, 1968; Lucas, 1988; Schoar, 2010). However, entrepreneurship is also characterized by a significant failure rate (Shane, 2008), low compensation compared to waged employment (Hamilton, 2000), and high exposure to nondiversified investments (Moskowitz and Vissing-Jørgensen, 2002). As standard theories of risk and return are not able to explain the high rate of entry (Hall and Woodward, 2010), the signature question facing entrepreneurship researchers is why individuals choose to start a firm in the first place.

A leading explanation is that individuals often overestimate their likelihood of successful firm creation (Astebro et al., 2014). Highly confident individuals are then attracted to the highly skewed returns to entrepreneurship despite the low average risk-adjusted returns.[1] In line with these arguments, surveys have confirmed entrepreneurs are confident in their likelihood of success (Åstebro et al., 2007), are more confident relative to the general population (Holm et al., 2013), and generally hold optimistic views in life (Puri and Robinson, 2007).[2] While valuable, these correlational findings abstract from identifying what drives variation in entrepreneurial overconfidence across the population, or even if overconfidence can be manipulated by outside factors. The current indirect evidence suggests these traits may be determined prior to adulthood as entrepreneurship is strongly predicted by genetics (Lindquist et al., 2016; Nicolaou et al., 2008), gender (Fairlie and Robb, 2009), and exposure to entrepreneurs during childhood years (Decker et al., 2016).[3]

This paper demonstrates entrepreneurial overconfidence is influenced by social interactions, leading to increased entrepreneurship among skilled workers. Under an experimental setting that randomizes the social networks of young managers, we observe peers confident in their abilities increase the rate of entrepreneurship in the economy. By directly surveying individuals, we confirm treated managers directly state they are more interested to start a business due to greater confidence. We also reject alter-

[1] For instance, Shane (2008) estimates over fifty percent of new firms fail within five years, while 0.03 percent achieved more than $100 million in sales.

[2] Closely related, researchers have found that overconfidence is common among managers (Ben-David et al., 2007; Malmendier and Tate, 2005) and this bias explains the risky investment decisions (Malmendier and Tate, 2008; Malmendier et al., 2011).

[3] For instance, Lindquist et al. (2015) estimate that 35% of an individual's decision start an incorporated firm can be explained by family background.

native explanations based on a peer's role in providing entrepreneurial knowledge or resources, as well as a change in risk aversion. We argue positive shocks to entrepreneurial confidence may offer benefits to the entrepreneurial sector. First, we confirm the women in our sample are less confident and less likely to enter entrepreneurship; however, connections to a confident peer disproportionately impacts female students, increasing the proportion of female entrepreneurship. Second, confident peers increase the likelihood of taking coursework in entrepreneurship,[4] leading to relatively successful entrepreneurs among the treatment group. Overall, we offer the first experimental evidence that peers increase the rate of entrepreneurship and link these variables through gains to confidence.

Our analysis requires (i) causal identification of peer effects, (ii) detailed employment data, and (iii) measures of an individual's experiences or views on entrepreneurship directly before interaction. To meet the first criteria we study students enrolled in the Master of Business Administration (MBA) program at Indiana University (IU).[5] At IU, every entering MBA student is randomly assigned to a cohort and a team in their first year in the program.[6] Students in the same cohort take the core MBA classes together, while students in the same team are assigned to work together on course projects and a large case study at the end of the first semester. Given that students do not choose these groups, some students will be more exposed to peer effects for reasons exogenous to their ability, effort, or interests.

To analyze each individual's career path before and after peer involvement with their peers, we obtain detailed individual-level employment records from a large online business networking service. From this online platform, we observe employment history (job title, location, start and end dates, firm name) and education (undergraduate institution, MBA major, graduation year). We also collect information on the employment and survival of each new firm. We then merge this data with the information about cohort and team assignments, and admissions information obtained from the MBA office at Indiana University. Finally, we use the online networking service to collect detailed employment information for each firm created by an individual in the sample.

To classify students confident in their entrepreneurial abilities, we incorporate admissions data de-

[4] We also find suggestive evidence that confident peers also increase the rate of joining a start-up, though results are not statistically significant.

[5] Ahern et al. (2014); Lerner and Malmendier (2013); Shue (2013) also explore a related setting. We differ from this past literature by precisely identifying peer interaction within groups of four individuals.

[6] A cohort has an average of approximately sixty students, while a team has four students on average. Depending on the year, an MBA class at IU has approximately 180 students.

tailing the intended major of the student prior to entering the MBA program. According to the sample, thirty-five percent intend to complete a major (either first or second) in entrepreneurship. We verify these students are significantly more likely to start a new firm following graduation. In addition, we survey incoming current students and confirm that students intending to major in entrepreneurship are significantly more (over)confident about their entrepreneurial abilities (according to three separate measures) even after controlling for other observable characteristics. In comparison, we find no evidence that individuals who want to major in entrepreneurship are less risk/ambiguity averse than the rest of the population, limiting the role of risk preferences in our setting.[7] We also do not observe greater optimism about the future, or stronger preferences for independence or workplace variety.[8] We then aggregate the number of confident peers within teams and cohorts.[9]

We estimate having one cohort member with high entrepreneurial confidence (but without prior entrepreneurial experiences) increases the rate of entry into entrepreneurship by 0.4 percentage points within three years after graduation. Given the rate of firm creation during the three years following MBA graduation (3.4 percentage points), peers increase firm creation by roughly twelve percent relative to the mean. In contrast, we estimate that interaction with a cohort member experienced in entrepreneurship actually decreases the rate of entrepreneurship by 0.6 percentage points, confirming the findings of Lerner and Malmendier (2013). By controlling for the intended major of each student, we can confirm students are modifying their future career plans in response to peer interaction.[10]

Given that each cohort has approximately sixty students, we hypothesize the effects will be larger if students were to interact in smaller groups, leading to tighter relationships. Since IU also forces students to interact in small teams of approximately four students, we can test this prediction. We show that a confident team member increases the overall rate of entering entrepreneurship by 1.2 percentage points;

[7] In this way, our results find further support for Holm et al. (2013); Koudstaal et al. (2015) who find no evidence that entrepreneurs are more risk averse than the rest of the population.

[8] In contrast to past research including Bengtsson and Ekeblom (2014), we actually find the students intending to major in entrepreneurship are less confident about future economic conditions compared to the rest of the sample.

[9] To classify students that previously started a new business we incorporate resumé and firm information from the online networking service. We estimate that 3.4 percent of the students in our sample had an unsuccessful entrepreneurial experience before the MBA.

[10] To further rule out the role of learning we confirm treatment continues to increase the rate of firm creation when (i) peers ultimately change to a major outside entrepreneurship or (ii) choose not to start a firm within five years of graduation. We argue these students may still influence the entrepreneurial confidence of other students, but are less likely to offer valuable advice to students about the entrepreneurial process.

that is, when interactions are tighter, treatment increases firm creation by roughly thirty-five percent relative to the mean.

We next assess the economic implications of peer influence on entrepreneurship. First, we evaluate the long-term effects by extending the time period for each student to start a new firm. We find the differences between the treated and untreated students remain five years following graduation, suggesting that peers cause the creation of firms that would otherwise not exist in the economy. Second, we measure entrepreneurial success by firm survival (lasting at least five years) and size (hiring at least ten employees), and confirm that student interactions impact the rate of successful firm creation. Third, entrepreneurs in our sample are more successful than the average entrepreneur in the economy. For example, by matching up the new firms in the sample to online information on funding sources, we estimate two percent of the firms created by IU-MBA graduates experience a successful exit by either being acquired or successfully completing an IPO. In addition, four percent of the firms receive venture capital funding, a rate six times higher than the average new firm in the economy (Robb and Robinson, 2012). Our results highlight the economic significance of peer influence on entrepreneurship.

To confirm the peer effect corresponds to increased entrepreneurial confidence, we directly survey the treated students in our sample (those with a team member intending to major in entrepreneurship) and establish three key findings. According to the responses, 22 percent of students report the team member increased their likelihood of start a firm, while no students reported a decrease in likelihood. In addition, among impacted students, 46 percent report a change in views towards entrepreneurship, compared to eight percent reporting an increase in knowledge (and 46 percent report both channels). Most significant for our study, the majority of students report their changing views are related to increased entrepreneurial confidence rather than (i) increased willingness to accept risk, (ii) increased expectations of the financial benefits, (iii) altered preferences regarding non-financial benefits, or (v) other changes. The results help establish a direct connection between peer influence and increased entrepreneurial confidence.

As prior evidence highlights lower rates of entrepreneurship among women (Fairlie and Robb, 2009), we next evaluate whether peer influence affects the gender composition of entrepreneurs. Assuming students endogenously sort into groups based on similar characteristics (i.e., male students interacting with other male students), the gender gap may be driven by peer effects as female workers will have

less interaction with past or future entrepreneurs. We first confirm women are (i) less likely to major in entrepreneurship and (ii) less likely to enter entrepreneurship even after controlling for intended major. Second, we analyze our earlier surveys and confirm current and incoming female MBA students are significantly less confident in their entrepreneurial abilities compared to the male students. Third, we estimate larger peer effects for women, suggesting that forced interaction is especially valuable when students are otherwise less likely to connect with entrepreneurs. While past research has argued the entrepreneurial gender gap may be related to social networks (Markussen and Røed, 2017), we are the first to examine this relationship in an experimental setting and the first to connect these findings through overconfidence.

Lastly, we assess whether increased confidence affects the quality of entrepreneurship. On the one hand, individuals who overestimate their entrepreneurial ability should create lower-quality firms as their realized return to entrepreneurship is lower than estimated at entry. On the other hand, developing an early career interest in entrepreneurship, even if driven by overconfidence, might lead to acquiring more entrepreneurial skills early in a manager's career (i.e., entrepreneurial education, employment in start-ups, improving professional network, or better career timing to start a firm). Our results show that firms founded by treated individuals are no worse than those created by control individuals (as measured by survival rates and employment size), suggesting the positive effects of overconfidence may outweigh the negative aspects outlined above. In addition, we provide supporting evidence on the micro-foundations of our hypothesis. As we observe intended and actual majors, we verify that individuals intending to major in entrepreneurship increase the likelihood their peers switch majors to entrepreneurship.[11] Furthermore, we confirm that students graduating with an entrepreneurship major are more likely to later create a firm relative to other MBA students. Our results offer novel evidence that altering entrepreneurial confidence early in the career will indirectly impact the proportion of successful entrepreneurs. In this way, we add to the literature evaluating the effects of entrepreneurial programs on later firm creation (Huber et al., 2014; Lyons and Zhang, 2018).

[11] Using employment at graduation, we also find weak evidence that individuals intending to major in entrepreneurship increase their peers likelihood of working at a start-up after graduation.

## 2 Literature Review

Our paper contributes to two separate literatures: (i) the behavioral traits of entrepreneurs and (ii) the role of social influence on entry to entrepreneurship. To begin, past research has analyzed whether entrepreneurs have unique behavioral traits from the rest of the population including optimism about the future (Puri and Robinson, 2007), risk aversion (Parker, 2009), ambiguity aversion (Knight, 1921), preferences for independence (Cooper and Saral, 2013), or preferences for variety (Åstebro and Thompson, 2011). Closest to our own research are papers analyzing whether entrepreneurs are overconfident in their abilities (Åstebro et al., 2007; Holm et al., 2013). We make two contributions to this literature. First, we offer novel evidence that entrepreneurial confidence is not a fixed trait, but instead impacted by social relationships. In this way, we build on a recent literature demonstrating behavioral preferences vary across time (Cohn et al., 2015; Guiso et al., 2018). Second, any behavioral differences between entrepreneurs and non-entrepreneurs may be driven by the fact that entrepreneurs have unique career experiences from the rest of the population. By observing the future entrepreneurial plans of skilled workers (rather than past experiences), we can measure differences in these individuals prior to starting a firm. According to our findings, workers intending to start a firm are more confident in their entrepreneurial abilities; however, we find no evidence of greater optimism, lower risk or ambiguity aversion, or stronger preferences for variety or independence. Therefore our results highlight the primary role of overconfidence in explaining entry to entrepreneurship.

Next, we add to the literature documenting peer influence on entrepreneurship rates (Giannetti and Simonov, 2009; Kacperczyk, 2013; Lerner and Malmendier, 2013; Markussen and Røed, 2017; Nanda and Sorensen, 2010). Especially close to our experimental setting is Lerner and Malmendier (2013), who find that peers with prior entrepreneurial experience decrease the rate of firm creation by offering advice on entrepreneurial ideas; to our knowledge, this result is unique as other past research documents peer influence increases entrepreneurship. We add to their work, and make three primary contributions to this literature. We are the first to confirm peers can causally increase the rate of entrepreneurship in an experimental setting. In addition, we are the first to causally identify that peers can affect a behavioral trait, such as overconfidence, which in turn may impact entry to entrepreneurship. And lastly, we reconcile the past literature by demonstrating the dual existence of negative and positive peer effects.

# 3 Data

This paper relies on the random assignment of MBA students, data on new firm creation and success, and information on each student's intended major. We first introduce our experimental setting by closely following Hacamo and Kleiner (2017), then summarize the datasets, and finally confirm students intending to major in entrepreneurship are more confident than the rest of the population.

## 3.1 Data Sources

**Kelley School of Business MBA Program.** Upon entry to the Full-Time MBA program, students are assigned to a cohort of roughly sixty students and take first semester courses together; each graduating class is composed of three or four cohorts in total. Students are also assigned to a team of four students and members must complete multiple case competitions and group homework assignments together. Assignment to a cohort and team is based on maximizing diversity within groups and is similar to methods in other MBA programs (Ahern et al., 2014; Shue, 2013). For students graduating in 2003-2010, assignment was based across five characteristics: gender, race (for domestic students), citizenship (classified as US or International), GMAT scores (grouped in quartiles), and undergraduate major (business, STEM disciplines, and all other majors). Starting with the class of 2011, the MBA office added Keirsey Personality Type as a sixth characteristic. While the system is electronic, staff members are also allowed to make manual corrections to achieve balance. Important to our study, students are not sorted based on their intended MBA major or future employment goals. This is a particular benefit of the data, as randomizing based on majors or employment goals will generate little variation across teams and cohorts (Chetty et al., 2011).

**Student Admissions and Transcript Data.** We collect additional information about students from applications and Indiana University transcripts. Application information includes personal characteristics (citizenship, gender, ethnicity, etc.), GMAT scores, and intended MBA major. We create seven fixed effects for nationality: US, India, China, South Korea, Japan, Taiwan, and Other, as all other nations compose less than one percent of the sample. Race is included only for domestic managers and is defined as: Asian, Black, Hispanic, White, and Other. Other includes multi-racial, Native American, and Pacific Islander,

which each comprise less than one percent of the sample. We split GMAT scores into quartiles and create a fixed effect for each subset. Finally, we distinguish between three undergraduate majors: STEM, Business/Economics, and Other and create three separate fixed effects.

**Online Business Networking Service Data.** To observe career outcomes over several years we match each student to his or her corresponding profile from a large online social network. The profiles include self-reported data on both employment and education. All data is publicly available and obtained through web searches and then parsed into a panel dataset.[12] From this data we identify students starting new firms. We define firm creation using the following criteria. First, we include individuals that classify their job title as 'founder' of a firm. Second, we include in our list of entrepreneurs any 'chief executive officer', 'chief financial officer', or 'owner' that joined their firms the same year of founding. Each firm's startup year is either directly observed in the firm's profile on the business networking website, or estimated using the earliest date any employee joined the firm (as observed on the website). Finally, we include individuals with job titles like 'self-employed' and 'entrepreneur' and job titles that contain the phrase 'independent'. We impose additional restrictions on these criteria. In particular, if the firm already has employees prior to a person joining, we require that person be explicitly classified as an owner or founder in order to count him/her as an entrepreneur.

**Data Cleaning.** To match each student in the sample to his or her online profile, we find all online profiles that state the individual attended the Indiana University MBA program. We then manually match profiles based on first and last name and year of graduation (when available on the profile). We drop any graduates without online profiles as well as cases where the profiles list incorrect graduation years. Finally, we confirm that the undergraduate college/university from the admissions data matches the listed undergraduate college/university according to the online profile. In total, we are able to match nearly 95% of MBA graduates to their online profiles.

[12] For a more detailed description of the data, we refer readers to Hacamo and Kleiner (2016).

### 3.2 Data Summary

**Student Demographics.** We first summarize firm creation across the sample in four separate figures. We include only students without prior experience in entrepreneurship in our sample. Figure 1 plots the rate of entrepreneurship by the year of graduation among all students in the MBA program. We require the students to start the firm within the first three years of graduation as the most recent class graduated in 2013. Rates of new firm creation are lowest among the class of 2004 and highest among the class of 2010. From the time-series, we identify a counter-cyclical pattern of firm creation.

We next measure entrepreneurship rates across subsets of the sample. First, Figure 2 distinguishes students with (i) no intention to major in entrepreneurship, and (ii) intending to either first or second major in entrepreneurship. We find students intending to major in entrepreneurship are nearly twice as likely to start a firm within five years of graduation. Second, Figure 3 splits the sample into students that (i) graduated the MBA with a major in entrepreneurship and (ii) those that majored in other fields. We find entrepreneurship majors are four times as likely to start a firm within five years of graduation. Third, Figure 4 distinguishes students (i) entering a start-up firm upon graduation, and (ii) those entering alternative employment. We find students entering a start-up are seventy-five percent more likely to start a firm within five years of graduation relative to the rest of the population.

We summarize the rates of entrepreneurship in Table 1. Our sample initially includes all MBA students graduating between 2003 and 2013. The sample initially includes 2,189 students. Excluding students with prior experience as an entrepreneur, we reduce the sample to a final 2,102 students. Among the students in our final sample, 1.2% of students found a new firm directly after graduation and 1.8% within a year of graduation. After three (five) years of graduation, rates of new firm creation increase to 3.4% (4.3%). Last, we define a small firm as any firm employing at most ten employees and define a young firm as any firm that started after the student graduated from the MBA. We define a start-up as any firm classified as either young or small. We find that sixteen percent of the sample joins (rather than starts) a start-up firm within the three years following graduation.

According to the data, fourteen percent of students intended to first major in entrepreneurship, while another eighteen percent intended to second major in entrepreneurship. According to the online networking service only four percent of students actually graduate with a first major in entrepreneurship.

Turning to the team and cohort results, each team has an average of four students, while each cohort has an average of sixty-two students. First, the average team includes 0.1 students with prior experience in entrepreneurship, compared to the 2.1 students in the average cohort. Second, the average team includes 0.5 students intending to first major in entrepreneurship, compared to 10.5 students in the average cohort. Third, the average team includes 0.6 students intending to second major in entrepreneurship, compared to twelve students in the average cohort.

**New Firm Demographics.** We summarize data on the new firm demographics in Figures 5 and 6. First, we estimate that over 90% of firms survive over one year, 70% survive three years, and over 40% survive for five years following creation. Second, to measure employment, we use the networking website to find all users who report that they are working (or have worked) for the new firms created by our entrepreneurs. Within our sample, over 90% hire an employee (other than the founder), 50% hire five employees, and over 40% hire at least ten employees during the life of the firm.

In addition, we note a small proportion of these firms are particularly successful. We attempt to match each firm in our sample to information on financing sources from an entrepreneurial networking website. According to the data, two percent of the firms created by IU-MBA graduates experience a successful exit by either being acquired or successfully completing an IPO; in addition, four percent of the firms received VC funding.

Finally, in unreported results, we also match each new firm to a two-digit NAICS code. New firms predominantly arise in the industries: Professional, Scientific, and Technical Services (23%), Information (17%), Health Care (14%), Finance and Insurance (12%), Retail Trade (7%), Administrative (7%), and Educational Services (7%).

### 3.3 Behavioral Traits of Entrepreneur Majors

**Entrepreneurial Confidence.** Given our focus on entrepreneurial confidence, it is necessary to confirm that students intending to major in entrepreneurship are actually more confident compared to the general population. However, this is challenging for two reasons. First, confidence is generally difficult to directly observe. Second, past students intending to major in entrepreneurship are also more likely to gain entrepreneurial experience following graduation; differences between these groups may therefore

be driven by later career experiences rather than initial beliefs.

To overcome both obstacles, we survey current and incoming Indiana University MBA students from the classes of 2020 and 2021 in the summer of 2019. We reached out to a total of 339 students across both classes and received a total of 179 responses, a response rate of 53%. Within each survey we ask three questions to measure entrepreneurial (over)confidence:

Q1: How confident are you in your ability to start a company?

Q2: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA students at Kelley?

Q3: Among past IU graduates that started a firm, only 5-10% employ ten or more workers within the first year. What is the likelihood you personally start a firm that employs ten or more workers within the first year?

The first question (Q1) develops a measure of *absolute confidence* on entrepreneurial ability as we do not incite a comparison with others nor provide a benchmark. We expect students who are either overconfident or aware of their high entrepreneurial ability to rank higher on this measure. We offer five potential answers, (i) Not Confident, (ii) Not Very Confident, (iii) Somewhat Confident, (iv) Confident, and (v) Very Confident. The second question (Q2) measures a student's *relative confidence* compared to other students in the same MBA class. We offer six multiple choice options: (i) Bottom 10% of students, (ii) Better than 10% of students, (iii) Better than 30% of students, (iv) Better than 50% of students, (v) Better than 70% of students, and (vi) Better than 90% of students. As in the first question, both overconfident individuals as well as those aware of their high entrepreneurial ability are likely to score higher in this question. The third question (Q3) measures whether students are confident in their abilities to start highly successful firms, and aims to separate *overconfident* individuals. We offer eight potential answers: (i) 0-1%, (ii) 1-2%, (iii) 2-5%, (iv) 5-10%, (v) 10-15%, (vi) 15-20%, (vii) 20-30%, (viii) 30-50%, and (ix) above 50%. We conjecture that students who respond above 10-15% are overconfident on their entrepreneurial ability. Our underlying assumption is that those who believe that their likelihood of starting a highly successful firm is well above the best entrepreneurs who attend the IU MBA are overconfident.

We present the third question (Q3) responses for both intended entrepreneurs and other students in Figure 7. The first columns measure the percent of students reporting a 0-1% likelihood of starting a firm with ten or more employees within the first year. The second columns measure the percent of students reporting at least a 1% likelihood of starting a firm with ten or more employees within the first year; the third columns measure the percent of students reporting at least a 2% likelihood of starting a firm with ten or more employees within the first year, etc. Turning to the results, we find students intending to major in entrepreneurship report significantly higher likelihoods compared to the rest of the student population. For example, 27.5% respond a likelihood of 15% or higher compared to 13.7% of students in other majors. At the end of the spectrum, 7.5% of students intending to major in entrepreneurship report at least a fifty percent chance of starting a highly successful firm compared to only 2.2% of other respondents. Overall, students who intend to major in entrepreneurship self report higher likelihoods of creating a highly successful firm, and the differences are especially great within the right-hand side of the distribution.

As discussed above, we are primarily interested in whether students intending to major in entrepreneurship are more confident than other students. Therefore, for each question we rank each potential multiple choice answer and create a categorical variable that varies between 1 and n, where n is the highest ranked answer.[13] Additionally, we use Q3 to pinpoint overconfidence by creating an outcome variable that equals one if the answer is above 10-15% and zero otherwise. We then estimate the relationship between intending to major in entrepreneurship and each measure of confidence under a linear regression model. We present the results in Panel A of Table 2. Each regression model controls for a wide range of controls including graduation year, gender, nationality, and race. The results in the first two columns report the estimations for Q1 and Q2, and show that students intending to major in entrepreneurship demonstrate higher absolute and relative entrepreneurial confidence. The last two columns in Panel A of Table 2 report the results for Q3. The third column reports the results when the outcome variable includes all possible answers categorized as described above. The fourth column reports the results when the outcome variable is a binary variable equal to one when the response is above 10-15%. All four results are statistically significant; the first and second result provide support for higher rates of entrepreneurial

[13]The answers listed in the previous paragraph are already sorted from lowest to highest rank.

confidence among students intending to major in entrepreneurship, and the last two results suggest these students are indeed overconfident.

**Alternate Behavioral Traits.** Students intending to major in entrepreneurship may differ from their peers in ways other than entrepreneurial confidence. This presents a concern in our identification strategy as students may influence these alternative behavioral traits. Therefore, we examine whether students intending to major in entrepreneurship differ from other students in their (i) optimism about the future, (i) risk and ambiguity aversion, and (ii) preferences for workplace independence and variety. We include the following questions in the survey:

Q4: Over the past 90 years, the US stock market has observed an average return of 9% a year. What will be the average annual US stock market return over the next ten years?

Q5: Among people born in the US in 1919, 1.4% are still alive in 2019. What is the likelihood you live to age 100?

Q6: How much would you pay for a lottery ticket that gives you a 50% probability of winning $500 and 50% of winning nothing?

Q7: How much would you pay for a lottery ticket that gives you a x% probability of winning $500? (x is between 25% and 75%)

Q8: How important is it for you to be in control of your daily schedule?

Q9: How important is it for you to have a job providing a variety of different tasks?

Each question is related to a potential behavioral characteristic that predicts entrepreneurship according to the literature. Q4 offers a measure of optimism about the economy (Bengtsson and Ekeblom, 2014). Q5 measures non-economic optimism (Puri and Robinson, 2007). Q6 measures risk aversion (Parker, 2009), while Q7 is about ambiguity aversion (Knight, 1921). Q8 details preferences for independence (Cooper and Saral, 2013) and Q9 concerns preferences for workplace variety (Åstebro and Thompson, 2011).

As before, we offer several multiple choice answers for each question, and describe all possible answers in the online appendix. We then rank each answer and convert to a positive integer. We estimate the relationship between intending to major in entrepreneurship and each characteristic. We then present the results in Panel B of Table 2. As before, we control for a wide range of controls including graduation year, gender, race, and nationality. Across all six measures, we only find one statistically significant link: students intending to major in entrepreneurship are less optimistic about future stock market returns, rather than more optimistic. Otherwise, we find no evidence that students intending to major in entrepreneurship hold different behavioral traits from the rest of the population. The results confirm the unique role of overconfidence in predicting entrepreneurial career plans.

# 4 Methodology

## 4.1 Empirical Specification

Forced social interactions offer a potentially valuable intervention in shaping an individual's entrepreneurial confidence as (i) peers influence the rate of firm creation (Giannetti and Simonov, 2009; Nanda and Sorensen, 2010) and (ii) prior experiments already confirm social networks can influence an agent's willingness to accept risk (Ahern et al., 2014; Mitton et al., 2018). However, focusing on social networks leads to two primary concerns. First, social networks may influence the rate of entrepreneurship through access to information and resources without altering confidence (Gompers et al., 2005). For instance, individuals with past entrepreneurial experience may discourage others from pursuing poor entrepreneurial endeavors (Lerner and Malmendier, 2013). To separately identify a change in confidence from learning access to information, we distinguish between (i) peers interested in starting a firm in the future but without prior entrepreneurial experience and (ii) peers with prior experience in entrepreneurship. We argue that while groups may impact entrepreneurial confidence, only the latter holds detailed knowledge about the entrepreneurial process. In a subsequent analysis presented below, we directly survey treated individuals to confirm this conjecture.

Second, to identify whether peers have a causal effect on the decision to start a firm, we must address the endogeneity concerns associated with peer effects (Hellerstein et al., 2015; Manski, 1993). In our set-

ting, we exploit the forced assignment of incoming students into cohorts and teams at Indiana University. Students in the same cohort take the core MBA classes together, while students in the same team are assigned to work together on course projects and a large case study at the end of the semester. Specifically, we follow the standard approach in the literature and estimate peer effects from these cohorts and teams through a linear-in-means regression framework (Graham, 2008; Manski, 1993):

$$\begin{aligned} Entrepreneur_i &= \alpha + \beta \times Treatment_i + \gamma \times Experienced\ Peer_i \\ &+ \rho \times Intended\ Entrepreneur_i + Controls_i + YearFE_i + \varepsilon_i \end{aligned} \tag{1}$$

where $Entrepreneur_i$ is a binary variable that takes a value of one when student $i$ starts a new firm following MBA graduation. While the results primarily focus on firm creation within three years of graduation, we also vary the time frame from one to five years after graduation. Our primary independent variable of interest is $Treatment_i$, a discrete variable denoting the number of cohort (or team) members of student $i$ that intend to major in entrepreneurship and have no prior entrepreneurial experience. We test the hypothesis that $\beta > 0$, which implies that individuals intending to major in entrepreneurship increase their peers' likelihood of firm creation.

First, to distinguish a behavioral effect from a transfer of entrepreneurial knowledge we follow the past literature and control for $Experienced\ Peer_i$: a discrete variable denoting the number of cohort (team) members of student $i$ that created a failed firm prior to entering the MBA program. Based on Lerner and Malmendier (2013) we expect $\gamma < 0$, which implies that individuals with prior unsuccessful entrepreneurship experience decrease the likelihood of entrepreneurship of her peers. Second, to explicitly identify a change in career plans, we control for whether the student intends to major in entrepreneurship. Specifically, we include the variable $Intended\ Entrepreneur_i$, which takes a value of one if student $i$ intends to either first of second major in entrepreneurship according to her MBA application.

Additionally, we include a year of graduation fixed effect since students are only randomly assigned within the same graduating class. We also include several other controls in the analysis to account for individual characteristics used by the MBA office in the assignment to teams and cohorts, namely: gender, citizenship, race, GMAT, and undergraduate major fixed effects. Finally, all errors are clustered at the

cohort (team) level.

# 5 Results

To test our hypotheses, we introduce three sets of results. First, we evaluate the influence of peers on new firm creation under a range of empirical specifications. Second, we test whether the results are driven by a change in entrepreneurial confidence. Third, we examine whether a shock to confidence leads to an increased rate of successful firms and a higher proportion of female entrepreneurs.

## 5.1 Peer Effects on Firm Creation

**Peer Effects at the Cohort Level.** In Table 3, we evaluate how peers influence firm creation. In Panel A, we define peers at the cohort-level, which include on average sixty-one students. The first and second column detail the results under a linear probability model, while the third and fourth columns offer the results under a probit regression model. The dependent variable of interest is a binary variable denoting the student founded a firm within three years of graduation. We use three years as the most recent MBA class graduated in 2013 and we collected employment data in 2016, allowing all students the same number of years to start a new firm. In Columns (1) and (3) of both panels, we include year fixed effects as students are only randomly assigned within the same graduating class. We also control for whether the student intended to major in entrepreneurship according to her application. In Columns (2) and (4), we add controls for experienced peers as well as demographics used in the sorting process: gender, nationality, race, GMAT score, and undergrad major.

According to Column (2) of panel A, we estimate that students with a cohort member intending to major in entrepreneurship (and without prior entrepreneurial experience) are 0.4 percentage points more likely to enter entrepreneurship. As the likelihood of starting a firm within three years of graduation is 3.4%, each cohort member increases the rate of peer new firm creation by 12% relative to the mean. Since these peers have no prior entrepreneurial experiences, the results lend support to our argument that peers influence entrepreneurial confidence. To the best of our knowledge, this is the first evidence that peers increase firm creation in an experimental setting.[14]

[14]While other researchers identify a similar positive relationship from peers within the same school (Kacperczyk, 2013), neigh-

In comparison, students with a cohort member with prior experience in entrepreneurship are 0.6 percentage points less likely to enter entrepreneurship, a decrease of over 20% relative to the mean. Recall from our earlier discussion that past research including Nanda and Sorensen (2010) report a positive correlation between an individual's past entrepreneurial experience and the incidence of firm creation of his workplace peers. However, in subsequent work, Lerner and Malmendier (2013) demonstrate in a randomized setting that an individual with entrepreneurial experience causally reduces the entry to entrepreneurship of her peers. Our results replicate the findings of Lerner and Malmendier (2013), while providing support for the existence of positive and negative peer effects. As a result, we are able to reconcile the opposing findings documented in the literature.

**Peer Effects at the Team Level.** In addition to cohorts, students are also assigned to a team of roughly four students, and students in the team complete group assignments and case studies together during the entire first year of the MBA. Given this close relationship, we expect peers to have a larger impact, relative to cohort members, on the career outcomes of fellow team members. We evaluate the influence of team peers on rates of new firm creation in Panel B of Table 3.

According to Column (2), we estimate that adding a peer intending to major in entrepreneurship increases the rate of firm creation among other team members by 1.2 percentage points, a 35% increase relative to the mean. We also estimate that adding a peer with entrepreneurial experience to a team decreases the rate of firm creation among other team members by two full percentage points, a decrease of over 50% relative to the mean. We note two deviations from the cohort results in Panel A of Table 3. First, the coefficients are significantly larger in size than the results from Panel A of Table 3. Second, the coefficients are no longer statistically-significant at the one percent level. Both results are likely driven by differences in the definition of a peer: as team are composed only four students (rather than sixty in the cohort), we expect greater peer influence due to team members, yet also more noise within the estimation.

**Nonlinear Specification.** Given the likelihood of firm creation is only 3.4% according to Table 3, the binary dependent variable takes a value of one for only a small set of students, potentially raising concerns that the linear probability model is a misfit for this application. To mitigate these concerns, we also

borhood (Markussen and Røed, 2017), or family (Lindquist et al., 2015), peers are not randomly assigned.

introduce a probit regression model in the third and fourth column of Panel A and B to ensure the results are robust to the modeling choice in the baseline estimation. We confirm that a student with a cohort (and team) member intending to major in entrepreneurship is more likely to start a new firm; meanwhile, a cohort (and team) member with prior experience in entrepreneurship decreases the likelihood other students start a new firm. The results suggest our prior estimates under the linear probability model do not depend on the particular empirical specification.

### 5.2 Economic Implications of Peer Effects

**Temporary or Permanent Effects?** The results highlight the influence of peers on firm creation. One explanation for our findings is that peers may simply impact the timing of firm creation; alternatively, peers may impact the ultimate decision to enter entrepreneurship, leading to the creation of firms that otherwise would not exist in the economy. If peer influence leads to a permanent increase in firm creation, then the estimated peer effects will remain persistent in the long-run. If peers only accelerate the timing of firm creation (as opposed to the overall likelihood), then we should observe peer effects dissipate as the horizon increases.

In Panel A of Table 4 we estimate the impact of peer influence on new firm creation at one to five years following MBA graduation. First, we estimate that treatment increases the rate of new firm creation among fellow cohort members by 0.2 percentage points after one year, compared to 0.4 percentage points after three years, and 0.4 percentage points after five years.[15] Given the results persist after five years, we conclude that peers have a permanent impact on entrepreneurship rates, leading to the creation of firms that would otherwise not exist in the economy.

**Do Peers Affect the Creation of Successful Firms?** Thus far, we define entrepreneurs in the sample by requiring (i) the student is identified as the founder of the firm and (ii) no other employees joined the firm prior to the student. One potential concern is that peers only influence the creation of small and unsuccessful firms. However, if the economic value of firm creation is contingent on the survival rate and employment growth, we can evaluate whether peers impact the rate of successful firm creation in

[15] In addition, we estimate that experienced peers decrease the rate of new firm creation among fellow cohort members by 0.4 percentage points after one year, compared to 0.6 percentage points after three years and 0.6 percentage points after five years.

our setting. To this end, we tighten the restriction of entrepreneur in Panel B of Table 4 by also requiring the firm (i) survives for at least $x$ years, or (ii) employs at least $x$ workers.

In Columns (1)-(3) , we estimate the impact of peers on establishing employer firms. Cohort members intending to major in entrepreneurship increase the rate of employer firms with at least six employees by 0.4 percentage points and employer firms with at least ten employees by 0.3 percentage points.[16] In Columns (4)-(6), we estimate the impact of peers on establishing resilient firms—those that survive for at least five years. We estimate the likelihood of starting a firm lasting at least five years increases by 0.3 percentage points when a cohort member intends to major in entrepreneurship (compared to a similar rate of 0.4 percentage points for firms lasting at least one year).[17] In sum, peers influence the likelihood of employer and resilient firms, highlighting the potential for real effects on the economy.

### 5.3 Do Peers Affect Entrepreneurial Confidence?

While the results above provide compelling evidence that peers influence the rate of firm creation, the precise channel linking these two variables is less clear. In this section, we attempt to better isolate a change in confidence through two additional analyses.

**Survey of Students following Treatment.** First, we augment our current dataset by surveying the treated students in the data. We contact each student with a team member intending to major in entrepreneurship; among the 495 students contacted, we received 185 replies, for a response rate of 37%. We then ask three questions:

Q1: In your first-year at IU-Kelley, one of your teammates was interested in becoming an entrepreneur and wanted to choose entrepreneurship as his/her MBA major. Did the team member impact the likelihood that you would started (or already started) a company?

Q2: If so, how did he/she affect your likelihood?

Q3: If he/she changed your views of entrepreneurship, in what what way?

[16] Cohort members with prior experience in entrepreneurship decrease the rate of employer firms with six or more employees by 0.4 percentage points and the rate of 10+ employee firms by 0.3 percentage points.

[17] The likelihood of starting a firm lasting at least five years decreases by 0.6 percentage points when a cohort member has prior experience in entrepreneurship (compared to a rate of 0.8 percentage points for firms lasting at least one year).

The multiple choice answers to the questions are reported in the online appendix. The survey results have three primary benefits. The first question confirms that peers intending to major in entrepreneurship increase interest in firm creation among the rest of the population. As students that have not started a new firm may still hold an interest in entrepreneurship, we can potentially identify a significantly larger peer effect than is directly observable from the employment histories. The second question helps distinguish between a change in behavioral traits and learning. The third question helps isolate which behavioral traits change. Specifically, we test whether peers influence (i) entrepreneurial confidence, (ii) risk aversion, (iii) optimism about the returns to entrepreneurship, or (iv) preferences toward non-monetary awards (such as valuing independence and variety).

We summarize the survey data in Figures 8, 9, and 10. First, we estimate that 22.4 percent of respondents reply that the peer team member increased their interest in starting a firm; in comparison, 77.6 percent of students report no impact and no students report a decrease. We note we are able to compare these findings directly to our regression analysis. According to Table 3, we estimated a team member increases the likelihood of firm creation by only 1.2 percentage points; therefore the majority of students that choose to not enter entrepreneurship are still influenced by treatment.

Second, among the students reporting the team member had an effect, 46 percent of students responded that the team member changed his/her views of entrepreneurship, 8 percent report he/she learned about entrepreneurship from the team member, and 46 percent responded that both channels are present. Therefore, while it is difficult to fully distinguish between these channels, we find peers disproportionately impact behavioral characteristics.

Third, we distinguish how peers influence a student's views towards entrepreneurship. Among the students reporting a change in views, we offered five possible responses: (i) made me confident about my abilities (shock to entrepreneurial confidence), (ii) decreased my concerns about the risk of owning business (shock to risk aversion), (iii) helped me realize I would enjoy entrepreneurship (shock to preferences), (iv) increased my expectations of monetary incentives (shock to optimism), or (v) other. According to the results 56.5% of the population reported a change in entrepreneurial confidence. In comparison, we find smaller effects on risk aversion (26.1%), entrepreneurial preferences (4.4%), optimism (0%), and other (4.4%). Overall, the survey results further support our argument that the increase in firm starts is

primarily driven by a change in entrepreneurial confidence.

**Confidence and Learning.** To provide further evidence that our results are unlikely driven by a shock to information flows, we examine two subsamples of confident peers who are likely to have little information on entrepreneurship: students who plan to major in entrepreneurship and then graduate with a different major or do not start a firm following graduation. In Columns (1) and (2) of Table 5, we define treatment as the number of cohort members that (i) intend to major in entrepreneurship and (ii) do not start a firm within five years following graduation. We estimate that treatment still increases the rate of firm creation by 0.6 percentage points. In Columns (3) and (4), we instead define treatment as the number of cohort members (i) intending to major in entrepreneurship and (ii) graduate from the MBA with a different major. According to this definition, peers increase firm creation rates by 0.4 percentage points. The results continue to hold even after excluding peers holding relevant information.

### 5.4 Do Peers Affect the Proportion of Female Entrepreneurs?

**Entrepreneurial Confidence across Gender.** The results above (i) find confident peers increase the rate of entrepreneurship in the economy and (ii) offer evidence that this relationship is due to increased confidence. Based on these results, we next examine the implications of a shock to entrepreneurial confidence on the economy. We first analyze the impacts of confident peers on the rate of female entrepreneurship as past researchers have found significantly lower rates of entrepreneurship among women compared to men (Fairlie and Robb, 2009). We hypothesize the gap may be partially driven by peer effects: assuming individuals endogenously choose to sort into groups based on similar characteristics (i.e. males interacting with other males), female workers will then have less interaction with past or future entrepreneurs (Markussen and Røed, 2017). For the women in our setting, the forced assignment of students into teams and cohorts may be the only chance to interact with entrepreneurial students, leading to greater peer effects, and ultimately, entrepreneurial diversity.

Before analyzing peer influence by gender, we offer three initial findings. First, according to Panel A of Table 6 female students are 5.4 percentage points less likely to intend to major in entrepreneurship. Second, we return to our survey results in Panel B and C of Table 6. According to two of the four measures of entrepreneurial confidence discussed above, we document that the women in the classes of 2020 and

2021 are less confident in their entrepreneurial abilities compared to the male students.[18] These results hold after controlling for the intended major of the student and suggest that a shock to entrepreneurial confidence may have a disproportionate impact on female workers. Third, we confirm that men are roughly twice as likely to start a new firm relative to female students in the sample. In Panel A of Table 7 we estimate that women are 1.2 percentage points less likely to start a firm in the first year after graduation and 3.2 percentage points less likely five years after graduation even after controlling for the intention to major in entrepreneurship. Therefore, we find evidence that the entrepreneurial gender gap widens over the student's career.

**Peer Effects on Firm Creation across Gender.** We measure peer effects separately among male and female students. According to the the first and second column of Panel B of Table 7, peer influence disproportionately affects female students. We estimate peers majoring in entrepreneurship increase firm creation by 0.8 percentage points among female students compared to 0.3 percentage points among the male students in the sample.[19]

The results above highlight the significance of peer effects on female students. Assuming students choose to form sub-groups with similar students within classroom settings (Carrell et al., 2013), we may also find larger peer effects among similar students (i.e. female peers have larger effects on other female students in the same cohort). We test this hypothesis in the third and fourth column of Panel B by distinguishing between male peers and female peers within the cohort. Focusing on female entrepreneurship, we find that a female peer intending to major in entrepreneurship increases firm creation by one percentage point (compared to 0.7 percentage points for the male peer). Overall, we offer suggestive evidence that the gender of the peer impacts the rate of firm creation.

### 5.5 Do Peers Affect the Success of Entrepreneurs?

**Peer Effects on the Proportion of Successful Firm Creation.** We next evaluate whether peer influence impacts the proportion of entrepreneurial success. We exclusively analyze students that founded a firm

[18] In addition, we find evidence that women are more risk averse and more ambiguity averse than their male counterparts.

[19] In unreported results, we establish similar results among racial minority students. First, we estimate white students are slightly more likely to start a new firm than international and U.S. minority students. Second, while we find limited evidence of peer affects on white students, peers with an intended major in entrepreneurship increase firm creation among minority students by 0.4 percentage points.

within three years of graduation. According to Column (2) of Table 8 we find cohort members intending to major in entrepreneurship affect the rate of success (defined as surviving at least five years) by 5.1 percentage points, though this estimate is not statistically significant at the 10% level. According to our estimates in Column (4), cohort members intending to major in entrepreneurship increase the rate of success (now defined as employing five or more workers) by 8.0 percentage points. We find no evidence that a shock to entrepreneurial confidence increases the proportion of unsuccessful new firms.

**Peer Effects on Majoring in Entrepreneurship.** According to the results above, peer influence does not lead to the creation of worse firms. This is surprising as overconfident individuals will enter entrepreneurship despite holding a lower realized ability. One possible explanation for our results is that as peers influence future career plans, they also impact educational choices and employment in start-ups, leading to greater knowledge about entrepreneurship. When acquiring knowledge in this fashion also increases the chance of firm survival and growth (conditional on starting a firm), peers will alter the proportion of successful entrepreneurship. This argument is based on Panel B of Table 8, which illustrates that majoring in entrepreneurship is correlated with entrepreneurial success, conditional on starting a firm. In Columns (1) and (2), we measure success as employment size; in Columns (3) and (4), we measure success as survival. According to the results, students intending to major in entrepreneurship are 42% more likely to employ five or more workers and 42% more likely to survive at least five years.

To test whether peers affect the desire of students to major in entrepreneurship, we exploit data on the intended major of each student prior to interaction. In Panel A of Table 9, we first confirm that, relative to other majors, entrepreneurship majors are six percentage points more likely to start a firm within a year of graduation and eleven percentage points more likely to start a firm within five years. In Panel B of Table 9, we next evaluate how peers influence the decision to major in entrepreneurship. According to the second column, treatment increases the likelihood of switching to an entrepreneurship major by 2.1 percentage points. As students are required to choose a major in the first year of the MBA program, the results confirm that peers immediately influence the decision to learn about entrepreneurship. The timing of the major choice also helps explain why peer influence during the first year of the MBA program can impact the rate of entrepreneurship years later.

**Peer Effects on Joining a Young or Small Firm.** For additional evidence, we next determine whether peers impact the choice to join a young firm (started after MBA graduation) or small firm (ten or fewer employees). Our analysis is guided by evidence suggesting individuals learn about firm creation through prior experience with start-ups (Guiso et al., 2015), and the assumption that employment with a start-up will lead to similar experiences as starting a firm—including a greater variety of responsibilities, experience with launching new products, exposure to income risk, and independence within the organization. In line with this argument, Panel A of Table 10 demonstrates that joining a young or small firm following MBA graduation increases the likelihood of starting a new firm by 2.7 percentage points within five years after graduation. For comparison, the effect is roughly a quarter the effect of majoring in entrepreneurship as measured above. We note students designated as a founder or owner of the company are not identified as joining a small/young firm.

We evaluate the impact of peers on joining a start-up following MBA graduation in Panel B of Table 10. According to Columns (1) and (2), a cohort member intending to major in entrepreneurship increases this likelihood by 0.4 percentage points, though the effect is not statistically significant at the 10% level. Besides offering additional evidence that peers influence the decision to learn about entrepreneurship, the results suggest peers may also allocate workers across young and small firms.

Combined with Table 9, our results contribute to the literature measuring the effects of learning about entrepreneurship on firm creation. Past research has found mixed evidence of these effects: while some studies illustrate that entrepreneurial training leads to increased firm creation (Huber et al., 2014; Lyons and Zhang, 2018), other researchers find more limited (or even negative) relationships (Fairlie et al., 2015; Oosterbeek et al., 2010; Von Graevenitz et al., 2010). By exploiting the random assignment of peers in classrooms, we offer new evidence that entrepreneurial learning (through education and on-the-job experience) does in fact increase the rate of firm creation.

### 5.6 Robustness Tests

**Peers with other Intended Majors.** Our framework exploits our unique data on the intended major of each student in the sample prior to peer interaction. To identify individuals with confidence in starting a new firm, we analyze students intending to major in entrepreneurship. If this interpretation is correct,

student peers intending to major in other subjects (finance, marketing, management, operations, and strategy) should not affect the rate of firm creation.

In Table 11 we find no statistical evidence that cohort members intending to major in subjects outside entrepreneurship influence the likelihood of firm creation.[20] We consider each subject in a separate regression and combine both first and second intended majors. Across all specifications, no coefficient is statistically significant at the 10% level. The lack of results under all specifications suggest that the intention to major in entrepreneurship is a unique predictor of entrepreneurial confidence.

## 6 Concluding Remarks

This paper offers causal evidence that overconfidence is time-varying and influenced by social interactions, leading to increased entrepreneurship among skilled workers. Though we focus our analysis on students pursuing an MBA at Indiana University, the results have significant implications outside the particular experimental setting. First, as individuals will routinely interact with peers outside their team or cohort, our estimates offer only a lower bound on the influence of peer interaction on firm creation. Policies that promote interaction between skilled workers, even within narrow contexts, will likely impact entrepreneurial confidence (and therefore entrepreneurship rates) across the economy. Second, we find the sign of peer influence is ambiguous and depends on peer attitudes towards entrepreneurship. Policy makers must be aware of the divergent impact of peers when designing policies promoting firm creation. Third, as peer influence predominantly affects female students, our results highlight the potential for policies supporting the diversity of entrepreneurs. Fourth, our findings suggest that promoting entrepreneurial confidence will increase the rate of firm creation without decreasing the conditional rate of success.

[20] In unreported results, we conduct a similar analysis identifying peers at the team level. Again, no coefficients are statistically significant at the 10% level.

# Appendix

Our analysis includes two separate surveys. First, we survey the Indiana University MBA classes of 2020 and 2021 during the summer of 2019. Of the 339 students contacted across both classes, we received a total of 179 responses, or a response rate of 53%. Second, we survey past alumni that were previously connected to a team member intending to major in entrepreneurship. Among the 495 prior students contacted from the classes of 2003-2013, we received 185 responses, or a response rate of 37%. We outline the questions and potential multiple choice options for each survey below.

**Survey of Current Students.**

Q1: How confident are you in your ability to start a company?

a) Not confident

b) Not very confident

c) Somewhat confident

d) Confident

e) Very confident

Q2: Do you believe you would be worse, equal, or better at starting a company relative to the other MBA students at Kelley?

a) Bottom 10% of students

b) Better than 10% of students

c) Better than 30% of students

d) Better than 50% of students

e) Better than 70% of students

f) Better than 90% of students

Q3: Among past IU graduates that started a firm, only 5 to 10% employ 10 or more workers within the first year. What is the likelihood you personally start a firm that employs 10 or more workers within the first year?

a) 0-1%

b) 1-2%

c) 2-5%

d) 5-10%

e) 10-15%

f) 15-20%

g) 20-30%

h) 30-50%

i) >50%

Q4: Over the past 90 years, the US stock market has observed an average return of 9% a year. What will be the average annual US stock market return over the next ten years?

a) 2-4% each year

b) 4-6% each year

c) 6-8% each year

d) 8-10% each year

e) 10-12% each year

f) 12-14% each year

g) 14-16% each year

h) above 16% each year

Q5: Among people born in the US in 1919, 1.4% are still alive in 2019. What is the likelihood you live to age 100?

a) 0-1%

b) 1-2%

c) 2-5%

d) 5-10%

e) 10-15%

f) 15-20%

g) 20-30%

h) 30-50%

i) >50%

Q6: How much would you pay for a lottery ticket that gives you a 50% probability of winning $500 and 50% of winning nothing?

a) Less than $50

b) 50-$100

c) 100-$150

d) 150-$200

e) 200-$250

f) More than $250

Q7: How much would you pay for a lottery ticket that gives you a x% probability of winning $500? (x is between 25% and 75%)

a) Less than $50

b) 50-$100

c) 100-$150

d) 150-$200

e) 200-$250

f) More than $250

Q8: How important is it for you to be in control of your daily schedule?

a) Not at all important

b) A little important

c) Somewhat important

d) Important

e) Very Important

Q9: How important is it for you to have a job providing a variety of different tasks?

a) Not at all important

b) A little important

c) Somewhat important

d) Important

e) Very Important

**Survey of Former Students.**

Q1: In your first-year at IU-Kelley, one of your teammates was interested in becoming an entrepreneur and wanted to choose entrepreneurship as his/her MBA major. Did the team member impact the likelihood that you would started (or already started) a company?

a) Yes

b) No

Q2: If so, how did he/she affect your likelihood?

a) I learned from my team member about entrepreneurship

b) I changed by views towards entrepreneurship

c) Both a change in views and learning

Q3: If he/she changed your views of entrepreneurship, in what what way?

a) He/she influenced my confidence about my abilities

b) He/she changed by views about the risk of business ownership

c) He/she changed my views about the financial benefits

d) He/she changed my views about the non-monetary benefits

e) Other

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## Table 1: Data Summary

This table reports the summary statistics of all variables in our sample. *Entrepreneur within X-y of MBA* is a dummy variable equal to one if an individual is an entrepreneur *X* years after graduating from the MBA program. *Joined Start-Up* is a dummy variable equal to one if, at the MBA graduation, an individual joins a firm that is younger than 2 years old or employs less than 10 workers. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship as first or second major. *Graduated Entrepreneur Major* is a dummy variable equal to one if a student effectively graduates with a major in entrepreneurship. *Experienced Peer (Team/Cohort)* measures the number of peers a student has in her first year MBA team/cohort with failed entrepreneurial experience. *Treatment (Team/Cohort)* measures the number of peers a student has in her first year MBA team/cohort who intend to major in entrepreneurship.

| | N | Mean | Std | 50th |
|---|---|---|---|---|
| Entrepreneur within 1y of MBA | 2102 | 0.018 | 0.13 | 0 |
| Entrepreneur within 2y of MBA | 2102 | 0.026 | 0.16 | 0 |
| Entrepreneur within 3y of MBA | 2102 | 0.034 | 0.18 | 0 |
| Entrepreneur within 4y of MBA | 2102 | 0.039 | 0.19 | 0 |
| Entrepreneur within 5y of MBA | 2102 | 0.043 | 0.20 | 0 |
| Joined Start-Up | 2102 | 0.16 | 0.36 | 0 |
| Graduated Entrepreneur Major | 2102 | 0.047 | 0.21 | 0 |
| Intended Entrepreneur | 2102 | 0.35 | 0.48 | 0 |
| Peer Intending to Major in Entre (Cohort) | 2102 | 22.3 | 8.04 | 21 |
| Peer Intending to Major in Entre (Team) | 2102 | 0.69 | 0.46 | 1 |
| Experienced Peer (Cohort) | 2102 | 2.12 | 1.82 | 2 |
| Experienced Peer (Team) | 2102 | 0.092 | 0.29 | 0 |
| Team Size | 2102 | 4.04 | 0.79 | 4 |
| Cohort Size | 2102 | 61.6 | 8.60 | 61 |
| MBA Graduation Year | 2102 | 2008.0 | 3.22 | 2008 |

## Table 2: Are Entrepreneurship Majors More Confident?

This table reports the behavioral traits of students intending to major in entrepreneurship. In Panel A, we estimate whether students intending to major in entrepreneurship are more confident in their entrepreneurial abilities. The first column measures absolute entrepreneurial confidence, the second column measures entrepreneurial confidence relative to other MBA students, and the third/fourth column measures entrepreneurial overconfidence. In Panel B, we estimate whether students intending to major in entrepreneurship are associated with other behavioral traits. The first column measures economic optimism, the second column measures non-economic optimism, the third column measure risk aversion, the fourth column measures ambiguity aversion, the fifth column measures a preference for independence, and the sixth column measures a preference for workplace variety. We control for differences in graduation year, gender, nationality, and race. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level.

**Panel A:** Entrepreneurial Confidence and Overconfidence

| | Entrepreneurial Confidence | | Entrepreneurial Overconfidence | |
|---|---|---|---|---|
| | Absolute (Q1) | Relative (Q2) | Measure 1 (Q3) | Measure 2 (Q3) |
| Intended Entrepreneur | 0.205* | 0.305* | 0.612** | 0.133* |
| | (1.81) | (1.81) | (2.40) | (1.75) |
| Year FE | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes |
| N | 179 | 179 | 179 | 179 |
| R-squared | .091 | .13 | .13 | .072 |

**Panel B:** Alternative Behavioral Traits

| | Optimism | | Risk/Ambiguity Aversion | | Preferences | |
|---|---|---|---|---|---|---|
| | Economic (Q4) | Noneconomic (Q5) | Risk (Q6) | Ambiguity (Q7) | Independence (Q8) | Variety (Q9) |
| Intended Entrepreneur | -0.406** | 0.222 | 0.086 | 0.144 | -0.076 | -0.088 |
| | (-2.26) | (0.51) | (0.29) | (0.55) | (-0.53) | (-0.57) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 179 | 179 | 179 | 179 | 179 | 179 |
| R-squared | .044 | .032 | .11 | .055 | .061 | .022 |

## Table 3: Do Peers Affect Firm Creation?

This table reports how confident peers affect firm creation. In Panel A, we identify peers at the cohort-level; in Panel B, we identify peers at the team-level. In the first and second columns of both panels, we estimate a linear probability model; in the third and fourth columns, we estimate a probit model. *Treatment* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort (in Panel A) or team (in Panel B) with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort-level in Panel A and the team-level in Panel B.

**Panel A:** *Cohort* Peer Effects

| | Linear | | Probit | |
|---|---|---|---|---|
| | (i) | (ii) | (i) | (ii) |
| Treatment | 0.003* | 0.004*** | 0.041** | 0.069*** |
| | (1.96) | (3.37) | (2.08) | (3.68) |
| Experienced Peer | | -0.006*** | | -0.098*** |
| | | (-3.20) | | (-2.93) |
| Intended Entrepreneur | 0.020** | 0.018** | 0.270*** | 0.250** |
| | (2.67) | (2.42) | (2.87) | (2.46) |
| Year FE | Yes | Yes | Yes | Yes |
| Gender FE | No | Yes | No | Yes |
| Nationality FE | No | Yes | No | Yes |
| Race FE | No | Yes | No | Yes |
| GMAT FE | No | Yes | No | Yes |
| Undergrad Major FE | No | Yes | No | Yes |
| N | 2102 | 2102 | 1919 | 1892 |
| R-squared | .016 | .035 | | |

**Panel B:** *Team* Peer Effects

| | Linear | | Probit | |
|---|---|---|---|---|
| | (i) | (ii) | (i) | (ii) |
| Treatment | 0.013* | 0.012* | 0.239 | 0.263* |
| | (1.95) | (1.78) | (1.61) | (1.73) |
| Experienced Peer | | -0.020** | | -0.472* |
| | | (-2.20) | | (-1.65) |
| Intended Entrepreneur | 0.025*** | 0.022*** | | 0.379*** |
| | (3.11) | (2.85) | | (3.04) |
| Year FE | Yes | Yes | Yes | Yes |
| Team Size FE | Yes | Yes | Yes | Yes |
| Gender FE | No | Yes | No | Yes |
| Nationality FE | No | Yes | No | Yes |
| Race FE | No | Yes | No | Yes |
| GMAT FE | No | Yes | No | Yes |
| Undergrad Major FE | No | Yes | No | Yes |
| N | 2102 | 2102 | 1919 | 1808 |
| R-squared | .018 | .041 | | |

## Table 4: Do Peers Affect the Entry of Successful Firms?

This table reports how confident peers affect cumulative firm creation and successful firm creation. In Panel A, we assess whether peers affect firm creation temporarily or permanently by estimating firm creation within X years following MBA graduation. We allow X to be 1,2,3,4,5 years. In Panel B, we measure successful firm creation as employing at least *X* employees, or surviving for a minimum of *X* years. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

**Panel A:** Do peers affect firm creation temporarily or permanently?

| | Firm Creation X Years after MBA Graduation | | | | |
|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| Treatment | 0.002** | 0.001* | 0.004*** | 0.004*** | 0.004*** |
| | (2.28) | (2.02) | (3.37) | (3.27) | (3.16) |
| Experienced Peer | -0.004** | -0.005*** | -0.006*** | -0.005** | -0.006** |
| | (-2.59) | (-3.04) | (-3.20) | (-2.42) | (-2.51) |
| Intended Entrepreneur | 0.014** | 0.023*** | 0.018** | 0.024** | 0.032*** |
| | (2.15) | (3.72) | (2.42) | (2.39) | (3.04) |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes |
| N | 2102 | 2102 | 2102 | 2102 | 2102 |
| R-squared | .034 | .039 | .035 | .037 | .04 |

**Panel B:** Do peers affect the entry of successful firms (employment and survival)?

| | Employment | | | Survival | | |
|---|---|---|---|---|---|---|
| | 2+ Emp | 6+ Emp | 10+ Emp | 1+ Years | 3+ Years | 5+ Years |
| Treatment | 0.003** | 0.004*** | 0.003*** | 0.004** | 0.003* | 0.003* |
| | (1.98) | (2.61) | (2.76) | (2.16) | (1.70) | (1.91) |
| Experienced Peer | -0.007** | -0.004* | -0.003 | -0.008** | -0.006* | -0.006** |
| | (-2.39) | (-1.71) | (-1.48) | (-2.35) | (-1.88) | (-2.20) |
| Intended Entrepreneur | 0.015** | 0.017*** | 0.012** | 0.016* | 0.013* | 0.014** |
| | (2.25) | (3.11) | (2.41) | (1.85) | (1.76) | (2.18) |
| Constant | -0.132 | -0.130 | -0.115 | -0.180 | -0.124 | -0.109 |
| | (-0.89) | (-1.08) | (-1.06) | (-0.99) | (-0.78) | (-0.78) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 2102 | 2102 | 2102 | 2102 | 2102 | 2102 |
| R-squared | .035 | .041 | .038 | .034 | .024 | .02 |

## Table 5: Do Peers Impact Learning about Entrepreneurship?

This table reports how confident peers affect firm creation under an alternate treatment measure. In the first and second column, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship, yet do not start a firm within five years of graduation. In the third and fourth column, *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship, yet do not graduate with a major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

| | Without Firm Creation | | Without Graduating with Major | |
|---|---|---|---|---|
| | (i) | (ii) | (i) | (ii) |
| Treatment | 0.004** | 0.006*** | 0.002 | 0.004** |
| | (2.54) | (3.17) | (1.59) | (2.65) |
| Experienced Peer | | -0.009*** | | -0.007*** |
| | | (-3.04) | | (-3.22) |
| Intended Entrepreneur | 0.021*** | 0.020** | 0.019** | 0.018** |
| | (2.74) | (2.45) | (2.68) | (2.37) |
| Year FE | Yes | Yes | Yes | Yes |
| Gender FE | No | Yes | No | Yes |
| Nationality FE | No | Yes | No | Yes |
| Race FE | No | Yes | No | Yes |
| GMAT FE | No | Yes | No | Yes |
| Undergrad Major FE | No | Yes | No | Yes |
| N | 2102 | 2102 | 2102 | 2102 |
| R-squared | .017 | .037 | .016 | .035 |

## Table 6: Does Entrepreneurial Confidence Vary Across Gender?

This table reports that women are less confident in their entrepreneurial abilities. In Panel A we analyze the relationship between gender and intending to major in entrepreneurship. In Panel B, we analyze the relationship between gender and (i) absolute entrepreneurial confidence (Column 1), (ii) relative entrepreneurial confidence (Column 2), and (iii) entrepreneurial overconfidence (Columns 3 and 4). In Panel C, we analyze the relationship between gender and (i) economic optimism, (ii) non-economic optimism, (iii) risk aversion, (iv) ambiguity aversion, (v) preference for independence, and (vi) preference for workplace variety. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

**Panel A:** Intended Major across Gender

| | Intended Entrepreneur | |
|---|---|---|
| | (i) | (ii) |
| Female Student | -0.075*** | -0.053** |
| | (-3.18) | (-2.18) |
| Year FE | Yes | Yes |
| Nationality FE | No | Yes |
| Race FE | No | Yes |
| GMAT FE | No | Yes |
| Undergrad Major FE | No | Yes |
| N | 2102 | 2102 |
| R-squared | .041 | .058 |

**Panel B:** Entrepreneurial Confidence across Gender

| | Entrepreneurial Confidence | | Entrepreneurial Overconfidence | |
|---|---|---|---|---|
| | Absolute | Relative | Measure 1 | Measure 2 |
| Female Student | -0.353*** | -0.570*** | -0.327 | 0.010 |
| | (-3.71) | (-3.78) | (-1.42) | (0.17) |
| Intended Entrepreneur | 0.205* | 0.305* | 0.612** | 0.133* |
| | (1.81) | (1.81) | (2.40) | (1.75) |
| Year FE | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes |
| N | 179 | 179 | 179 | 179 |
| R-squared | .091 | .13 | .13 | .072 |

**Panel C:** Alternate Behavioral Traits across Gender

| | Optimism | | Risk/Ambiguity Aversion | | Preferences | |
|---|---|---|---|---|---|---|
| | Economic | Noneconomic | Risk | Ambiguity | Independence | Variety |
| Female Student | 0.111 | 0.352 | -0.411 | -0.414* | 0.090 | 0.209* |
| | (0.61) | (0.91) | (-1.56) | (-1.79) | (0.71) | (1.85) |
| Intended Entrepreneur | -0.406** | 0.222 | 0.086 | 0.144 | -0.076 | -0.088 |
| | (-2.26) | (0.51) | (0.29) | (0.55) | (-0.53) | (-0.57) |
| Year FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes | Yes |
| N | 179 | 179 | 179 | 179 | 179 | 179 |
| R-squared | .044 | .032 | .11 | .055 | .061 | .022 |

## Table 7: Do Peer Effects Vary Across Gender?

This table reports that women are less likely to enter entrepreneurship and that confident peers disproportionately affect firm creation among women. In Panel A, we estimate the rate of firm creation within X years following graduation by gender. In Panel B, we estimate male and female peer effects on firm creation. In the first and second column, we consider both male and female peers. In the third and fourth column, we distinguish between male and female peers. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Experienced Peer* measures the number of peers in her first year MBA cohort with a failed entrepreneurial experience. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

**Panel A:** Firm Creation across Gender

| | Firm Creation (X+ Years) | | | | |
|---|---|---|---|---|---|
| | 1+ Years | 2+ Years | 3+ Years | 4+ Years | 5+ Years |
| Female Student | -0.012* | -0.020** | -0.027*** | -0.030*** | -0.032*** |
| | (-1.68) | (-2.43) | (-2.80) | (-2.97) | (-3.07) |
| Intended Entrepreneur | 0.013** | 0.022*** | 0.015* | 0.021** | 0.029*** |
| | (2.11) | (2.96) | (1.79) | (2.30) | (3.04) |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes |
| N | 2102 | 2102 | 2102 | 2102 | 2102 |
| R-squared | .034 | .038 | .033 | .035 | .038 |

**Panel B:** Peer Effect on Firm Creation across Gender

| | All Peers | | Peers by Gender | |
|---|---|---|---|---|
| | Female | Male | Female | Male |
| Treatment | 0.008*** | 0.003* | | |
| | (3.12) | (1.83) | | |
| Treatment (Female Peer) | | | 0.010*** | 0.003 |
| | | | (3.47) | (1.56) |
| Treatment (Male Peer) | | | 0.007** | 0.003 |
| | | | (2.32) | (1.24) |
| Experienced Peer | -0.017*** | -0.003 | -0.017*** | -0.003 |
| | (-2.98) | (-1.04) | (-2.95) | (-0.98) |
| Intended Entrepreneur | 0.008 | 0.022** | 0.014 | 0.025** |
| | (0.73) | (2.31) | (1.20) | (2.64) |
| Year FE | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes |
| N | 539 | 1563 | 539 | 1563 |
| R-squared | .083 | .037 | .084 | .037 |

## Table 8: Do Peers Affect the Rate of Entrepreneurial Success?

This table reports that confident peers affect the proportion of successful firm creation. We condition the sample on the set of students starting a firm within three years of graduation. In the first and second column, we define success as employing at least five employees. In the third and fourth column, we define success as surviving at least five years. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

| | 5+ Years | | 5+ Employees | |
|---|---|---|---|---|
| | (i) | (ii) | (i) | (ii) |
| Treatment | 0.019 | 0.051 | 0.054 | 0.080** |
| | (0.48) | (1.35) | (1.61) | (2.04) |
| Intended Entrepreneur | 0.073 | 0.419*** | 0.230* | 0.418** |
| | (0.53) | (3.21) | (1.71) | (2.40) |
| Year FE | Yes | Yes | Yes | Yes |
| Gender FE | No | Yes | No | Yes |
| Nationality FE | No | Yes | No | Yes |
| Race FE | No | Yes | No | Yes |
| GMAT FE | No | Yes | No | Yes |
| Undergrad Major FE | No | Yes | No | Yes |
| N | 72 | 72 | 72 | 72 |
| R-squared | .084 | .5 | .14 | .38 |

## Table 9: Do Peers Influence a Change in Major Towards Entrepreneurship?

This table reports that individuals who graduate with a major in entrepreneurship are more likely to become entrepreneurs and that confident peers influence a change in major towards entrepreneurship. In Panel A, we estimate the effect of majoring in entrepreneurship on firm creation within *X* years following graduation. In Panel B, we estimate peer effects on graduating with a major in entrepreneurship. *Graduated Entrepreneur Major* is a dummy variable equal to one if a student effectively graduates with a major in entrepreneurship. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

**Panel A:** Does majoring in entrepreneurship impact firm creation?

| | Firm Creation X Years after MBA Graduation | | | | |
|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| Graduated Entrepreneur Major | 0.061** | 0.096*** | 0.092*** | 0.085*** | 0.111*** |
| | (2.25) | (3.02) | (2.88) | (2.67) | (3.18) |
| Intended Entrepreneur | 0.008 | 0.014* | 0.008 | 0.014 | 0.020* |
| | (1.21) | (1.77) | (0.89) | (1.42) | (1.94) |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes |
| N | 2102 | 2102 | 2102 | 2102 | 2102 |
| R-squared | .043 | .054 | .044 | .043 | .05 |

**Panel B:** Do peers influence others to major in entrepreneurship?

| | Graduating with an Entrepreneurship Major | |
|---|---|---|
| | (i) | (ii) |
| Treatment | 0.024** | 0.023** |
| | (2.50) | (2.33) |
| Intended Entrepreneur | 0.079*** | 0.080*** |
| | (6.14) | (6.13) |
| Year FE | Yes | Yes |
| Gender FE | No | Yes |
| Nationality FE | No | Yes |
| Race FE | No | Yes |
| GMAT FE | No | Yes |
| Undergrad Major FE | No | Yes |
| N | 2102 | 2102 |
| R-squared | .04 | .058 |

## Table 10: Do Peers Influence the Likelihood of Working in a Startup?

This table reports that individuals who join a start-up at graduation are more likely to become entrepreneurs in the long-run and that confident peers influence the decision to join a start-up. Specifically, in Panel A, we estimate the likelihood that an individual who joined a start-up at graduation becomes an entrepreneur within *X* years following graduation. In Panel B, we estimate whether peers affect the likelihood that cohort members join a start-up at graduation. A start-up is defined as a firm that is younger than 2 years old or employs less than 10 workers. *Joined Start-Up* is a dummy variable equal to one if, at the MBA graduation, an individual joins a start-up. *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. *Treatment* measures the number of peers in her first year MBA cohort who intend to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

**Panel A:** Does working in a startup affect the likelihood of becoming an entrepreneur?

| | Firm Creation X Years after MBA Graduation | | | | |
|---|---|---|---|---|---|
| | 1 Year | 2 Years | 3 Years | 4 Years | 5 Years |
| Joined Start-Up | 0.011 | 0.019* | 0.021 | 0.023* | 0.027* |
| | (1.25) | (1.69) | (1.64) | (1.71) | (1.88) |
| Intended Entrepreneur | 0.013** | 0.021*** | 0.015* | 0.020** | 0.028*** |
| | (2.00) | (2.75) | (1.72) | (2.14) | (2.76) |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes |
| N | 2102 | 2102 | 2102 | 2102 | 2102 |
| R-squared | .034 | .04 | .035 | .037 | .04 |

**Panel B:** Do peers influence the likelihood of working in a startup?

| | Joining a New/Small Firm | |
|---|---|---|
| | (i) | (ii) |
| Treatment | 0.004 | 0.004 |
| | (1.39) | (0.98) |
| Intended Entrepreneur | 0.023 | 0.019 |
| | (1.36) | (1.12) |
| Year FE | Yes | Yes |
| Gender FE | No | Yes |
| Nationality FE | No | Yes |
| Race FE | No | Yes |
| GMAT FE | No | Yes |
| Undergrad Major FE | No | Yes |
| N | 2102 | 2102 |
| R-squared | .0034 | .021 |

## Table 11: Do Peers in Other Intended Majors Affect Firm Creation?

This table reports how peers in other intended majors influence the rate of firm creation. *Treatment (Finance)* measures the number of peers in her first year MBA cohort who intend to major in finance (and likewise for marketing, management, operations, and strategy). *Intended Entrepreneur* is a dummy variable equal to one if a student declares in her MBA application an intent to major in entrepreneurship. We use * to denote significance at the 10% level, ** to denote significance at the 5% level, and *** to denote significance at the 1% level. We cluster standard errors at the cohort level.

| | Firm Creation | | | | |
|---|---|---|---|---|---|
| | (i) | (ii) | (iii) | (iv) | (v) |
| Treatment (Finance) | -0.000 | | | | |
| | (-0.38) | | | | |
| Treatment (Marketing) | | 0.001 | | | |
| | | (0.65) | | | |
| Treatment (Management) | | | -0.000 | | |
| | | | (-0.12) | | |
| Treatment (Operations) | | | | -0.001 | |
| | | | | (-0.50) | |
| Treatment (Strategy) | | | | | 0.001 |
| | | | | | (1.19) |
| Intended Entrepreneur | 0.015* | 0.015* | 0.015* | 0.015* | 0.015* |
| | (1.99) | (1.97) | (1.99) | (1.99) | (1.99) |
| Year FE | Yes | Yes | Yes | Yes | Yes |
| Gender FE | Yes | Yes | Yes | Yes | Yes |
| Nationality FE | Yes | Yes | Yes | Yes | Yes |
| Race FE | Yes | Yes | Yes | Yes | Yes |
| GMAT FE | Yes | Yes | Yes | Yes | Yes |
| Undergrad Major FE | Yes | Yes | Yes | Yes | Yes |
| N | | | | | |
| R-squared | 2102 | 2102 | 2102 | 2102 | 2102 |
| r2 | .033 | .033 | .033 | .033 | .033 |

**Figure 1: Firm Creation by MBA Graduation Year**

This figure illustrates the rate of firm creation by MBA Graduation year. We consider any firm created by an MBA student within 3 years after graduation.

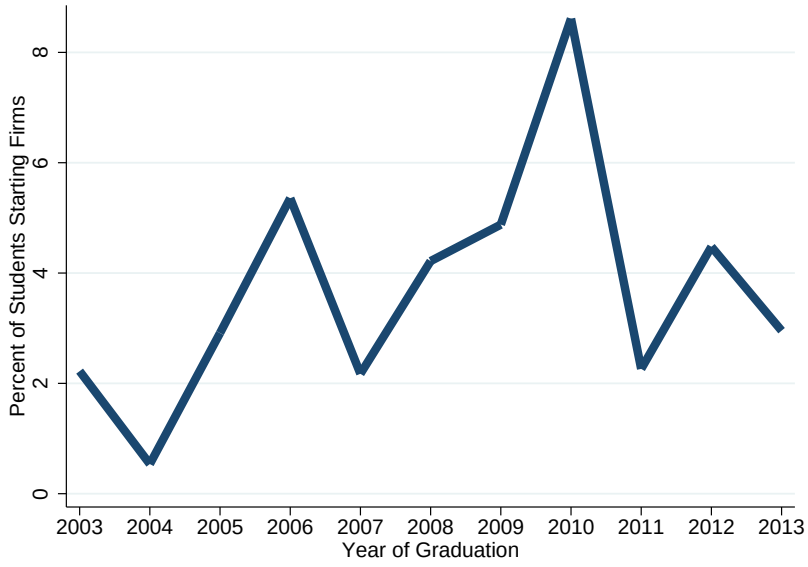
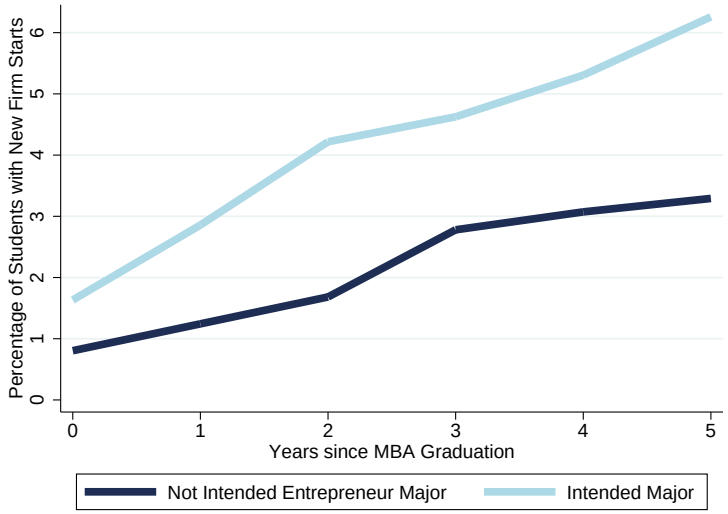


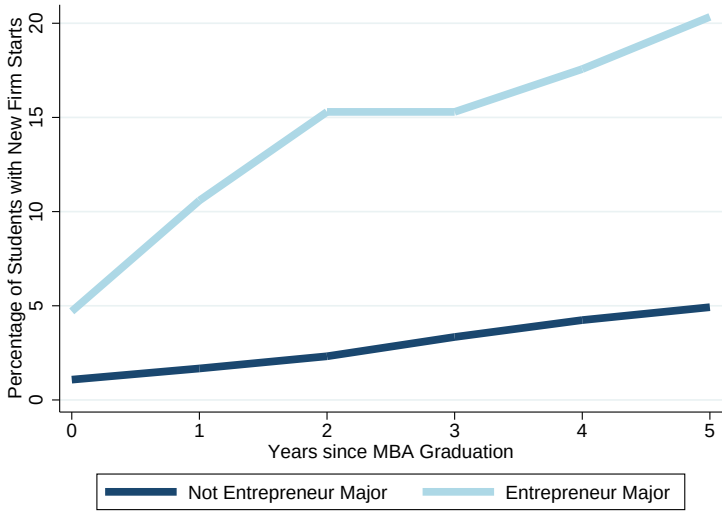

**Figure 2: Cumulative Firm Creation By Intention to Major in Entrepreneurship**

This figure illustrates the rate of firm creation for students intending and not intending to major in entrepreneurship. The light blue line reports the rate for students intending to major in entrepreneurship, and the dark blue line for students intending to major in any other majors.



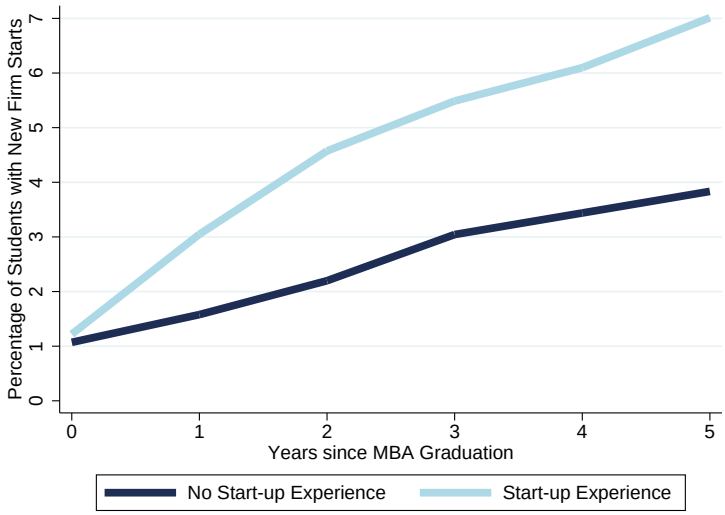
## Figure 3: Cumulative Firm Creation By Major in Entrepreneurship at Graduation

This figure illustrates the rate of firm creation for students graduating with a major in entrepreneurship and graduating without a major in entrepreneurship. This figure differs from the prior figure by using actual graduation majors instead of intended majors declared in the application process.



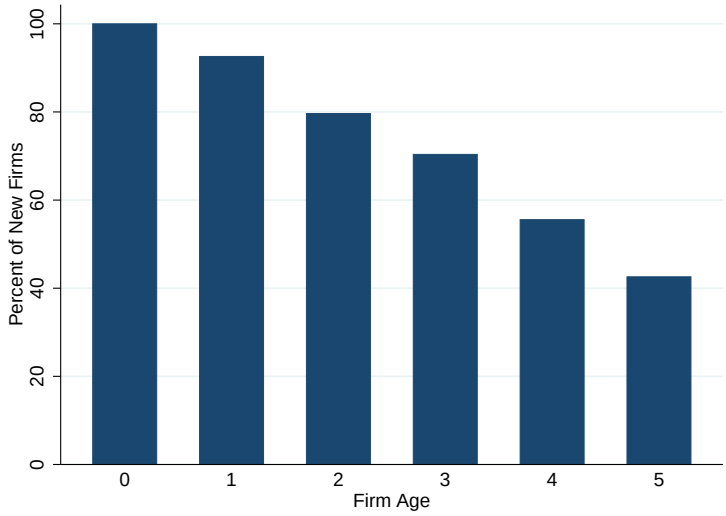

## Figure 4: Cumulative Firm Creation By Start-Up Experience at Graduation

This figure illustrates the rate of firm creation for students who choose to work at a start-up at graduation versus students that choose to work at other established companies. A start-up is defined as a firm that is small (10 or fewer employees) or young (founded after the year of MBA graduation).



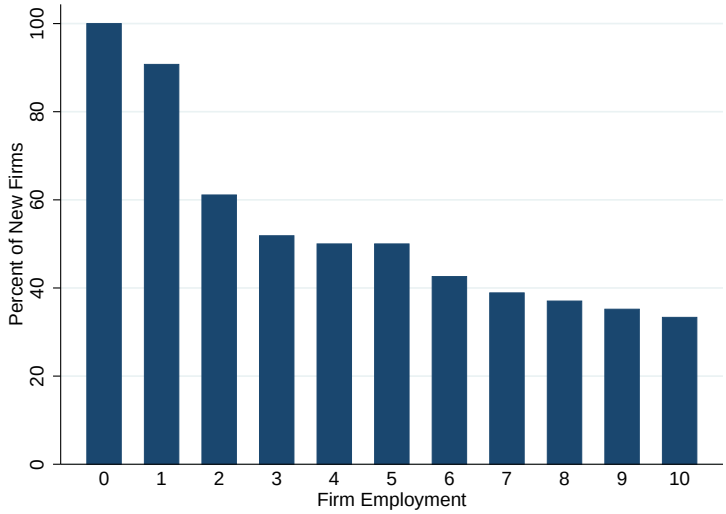
## Figure 5: Age of New Firms

This figure illustrates the percent of firms, which were founded by entrepreneurs in the sample, that survive zero to five years after creation.



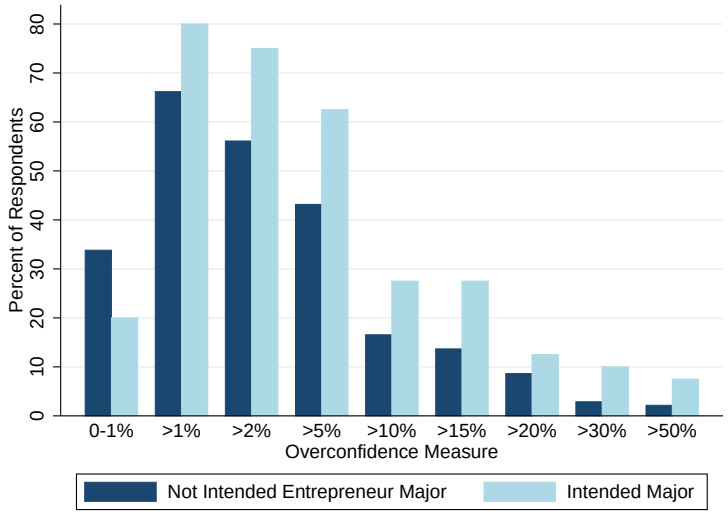

## Figure 6: Employment of New Firms

This figure illustrates the percent of firms, which were founded by entrepreneurs in the sample, that employ zero to ten employees (not including founder).



## Figure 7: Overconfidence of Intended Entrepreneurs

This figure illustrates the survey responses to question Q3 (described in section 3.3) of current MBA students. Students are asked the likelihood they start a firm that employs ten or more workers within the first year following MBA graduation. We distinguish between students intending to major in entrepreneurship according to the MBA application and all other students. The first columns measure the percent of students reporting a 0-1% lilkelihood of starting a firm with ten or more employees within the first year. The second columns measure the percent of students reporting at least a 1% lilkelihood of starting a firm with ten or more employees within the first year; the third columns measure the percent of students reporting at least a 2% lilkelihood of starting a firm with ten or more employees within the first year, etc.




## Figure 8: Likelihood of Entrepreneurship from Survey

This figure illustrates the survey responses to question Q1 (described in section 5.3) of treated students. Students with a positive team member are asked whether the team member increased/decreased the likelihood of firm creation.

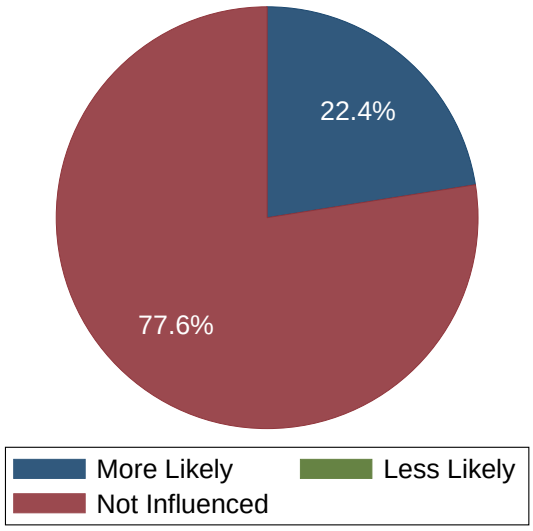


**Figure 9: Behavioral Traits vs. Learning from Survey**

This figure illustrates the survey responses to question Q2 (described in section 5.3) of treated students. Students reporting a positive effect from a team member are asked whether the effect is driven by a change in views towards entrepreneurship or learning about entrepreneurship.

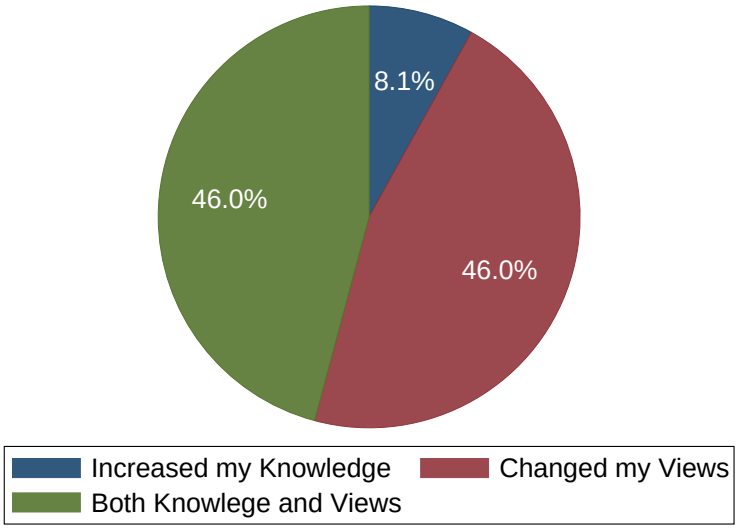



**Figure 10: Behavioral Channels from Survey**

This figure illustrates the survey responses to question Q3 (described in section 5.3) of treated students. Students reporting a change in views towards entrepreneurship are asked how their views changed and offered five potential responses: (i) confidence in entrepreneurial ability, i(i) willingness to take risk in starting a business, (iii) increased expectations of the rewards of starting a business, (iv) greater appreciation for non-monetary benefits, or (v) other.

