Taste for competition and the gender gap among young business professionals

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ABSTRACT

We study whether and why taste for competition (as measured by Niederle and Vesterlund, 2007) affects MBA salaries and whether this effect can explain the wage gender gap. At graduation, MBAs with higher taste for competition earn $15K (9.3%) more. Over time this effect is mitigated by overconfidence. Seven years after graduation, competitive MBAs with a low degree of overconfidence earn 26% more, while those who are highly overconfident earn 19% less. Taste for competition explains 10% of the gender gap at graduation and none seven years later.

This version: November 2019

JEL Codes: J16, J30, D90, I21

Keywords: gender gap; gender differences; taste for competition; competitiveness; overconfidence; business career.

Acknowledgments: We thank the Templeton Foundation for financial support. We are also thankful for the comments we received from numerous seminars and conferences.

There is a growing literature that attempts to explain differences in career choices and market outcomes (and particularly gender differences) on the basis of differences in taste (e.g., see the discussion in Bertrand 2018). One of the main challenges for this literature is the difficulty of inferring preferences from observed outcomes, since outcomes can be driven not just by taste but also by societal biases and other types of constraints. For example, it is incorrect to conclude that there are differences in preferences regarding academic subjects based merely on the observation that women are less prevalent in STEM fields (Handelsman et al. 2005). Similarly, the choice of working fewer hours may not be necessarily driven by preferences for career interruption, but could be the result of societal biases and obstacles (Blau and Kahn 2017). In this respect, laboratory experiments can provide a powerful tool to measure preferences precisely (Roth 1995).

One measure that has shown a high degree of external validity and typically exhibits substantial gender differences is *taste for competition*, as measured in the lab by Niederle and Vesterlund (2007).[1] In this paper, we use this lab measure to study differences in earnings among high-ability business professionals.

The participants of our study consist of individuals who obtained a master's degree in business administration (MBA) from one of the top-ranked business schools in the United States. This is an interesting group of people to study because many of the jobs these students aspire to are in industries known for being competitive and displaying noticeable gender differences (Bertrand, Goldin, and Katz 2010). Moreover, the recruiting process for these jobs involves a competitive process where recruiting firms meet candidates through social mixers, presentations, and several rounds of formal interviews.

Thanks to an extensive data collection effort, we have access to several incentivized measures of individual traits, earnings, and many demographics. Unique to our study, we measure taste for competition two years before students graduate, and we have information about accepted job offers at graduation, when recruiters set base salaries and bonuses on the basis of expected performance, as well as their compensation seven years later, when reported earnings are based on realized performance (especially bonuses).

To measure taste for competition, we use the experimental design of Niederle and Vesterlund (2007), which consists of giving participants the opportunity to earn money by answering simple arithmetic problems under two different incentive schemes: piece-rate and tournament.[2] In the

[1] See Niederle and Vesterlund (2011) and Dariel et al. (2017) for surveys of published work on gender differences in taste for competition.

[2] Since we study a setting (business) that is stereotypically male, we elicit taste for competition using a task in an area (math) that is typically associated with men (Reuben, Sapienza, and Zingales, 2014; Bohnet, van Geen, and Bazerman 2016). Experiments using this task in various subject pools have consistently found that men choose the tournament more often than women (e.g., Niederle and Vesterlund, 2007; Cason, Masters, and Sheremeta, 2010; Healy and Pate, 2011; Balafoutas and

piece-rate condition, participants do not compete with others and simply earn $4 per correct answer. In the tournament condition, participants compete with three other randomly chosen participants and earn $16 per correct answer if they have the highest performance in their group (and zero otherwise). The participants' taste for competition is assessed by letting them choose between performing under piece-rate and tournament, after controlling for their performance, risk preferences, and degree of overconfidence.

When we look at the accepted job offers at graduation, we find that the total earnings of individuals who exhibited a taste for competition in the experiment two years before are 9 log points higher than those who did not (around $15k more per year), a sizeable effect comparable in magnitude to the effect of gender. In addition, we find that the gender difference in taste for competition accounts for around 10% of the gender difference in total earnings.[3] Earnings at graduation consist of three components: base salary, one-off bonuses (e.g., relocation and tuition benefits), and performance bonuses set in advance based on performance expectations. Both taste for competition and gender explain substantial differences in the performance bonuses, while the differences in base salaries are much smaller. Importantly, the experimental measure of taste for competition is not strongly correlated with the large set of control variables, and therefore, it accounts for variance in earnings and in the gender gap that would otherwise remain unexplained. We explore three sources for the effect of taste for competition: industry selection, more aggressive in bargaining for higher compensation, and the possibility that companies value this attribute. Interestingly, we find that neither industry selection nor bargaining for higher compensation is the primary driver of the effect of taste for competition.

When we repeat the estimation using the 2015 salary and 2014 realized bonus, we find that taste for competition retains a positive impact on total compensation, but this impact is quantitatively smaller and not statistically significant at conventional levels. To explain the differences between salary offers in 2008 and earnings in 2015, we investigate whether taste for competition interacts with other traits that employers are likely to learn over time through the individuals' realized performance.

A company should find taste for competition desirable only when it is not associated with overconfidence because individuals who like to compete but overestimate their probability of winning will enter competitions that they will end up losing. To test this hypothesis, we interact taste for competition with overconfidence. We find that the interaction between taste for competition and overconfidence has a negative effect on total earnings. This effect is small and statistically

Sutter, 2012; Niederle, Segal, and Vesterlund, 2013). That being said, gender differences in taste for competition are sometimes diminished when measured with stereotypically-female tasks (e.g., Kamas and Preston 2010; Dreber, von Essen, and Ranehill, 2014; Wozniak, Harbaugh, and Mayr, 2014).

[3] Although explaining 10% of the gender gap might not be considered that much, we should point that the sole measure of taste for competition explains half as much of the gender gap in earnings as a rich set of variables that include demographic characteristics, academic performance, and experimental and survey measures of important psychological attributes.

insignificant in the 2008 data, but it is both large and statistically significant in the 2015 data. In 2015, MBAs with a high taste for competition who have a low degree of overconfidence (one standard deviation below the mean) earn 26% more while those who are highly overconfident (one standard deviation above the mean) earn 19% less. One possible reason for why this result is more pronounced in later in their careers is that employers cannot condition compensation on the degree of overconfidence of recruits because they are unable to detect it at that point, but that can do so over time. An alternative reason is that, unlike salary and bonus at graduation, compensation for business professionals in later years is often based on realized performance. If workers who are competitive and overconfident have lower performance, our results can be explained by performance set bonuses, which is the component of their compensation where the effect of taste for competition is concentrated.

In sum, we find that taste for competition is an important variable in explaining people's compensation. As companies learn their employees' type or are able to set bonuses based on realized performance, they seem to penalize competitive and overconfident workers. However, despite being good predictors of earnings, both taste for competition and overconfidence have a marginal effect in explaining gender differences in compensation, which grew substantially seven years after graduation.

This paper contributes to the growing literature on gender differences in taste for competition and, more specifically, to studies relating incentivized measures of taste for competition to gender differences in labor-market outcomes.[4] The most prominent study in this area is Buser, Niederle, and Oosterbeek (2014), where they use the same measure of taste for competition to predict the educational choices of high school students in the Netherlands. They find that competitive individuals are 20% more likely to select the math and science study track. Moreover, they find that controlling for taste for competition reduces the gender gap in track choice by around 20%. Buser, Peter, and Wolter (2017a) subsequently replicated these findings with high school students in Switzerland. Building on Buser, Niederle, and Oosterbeek (2014), Reuben, Wiswall, and Zafar (2017) and Kamas and Preston (2018) study whether individuals with a high taste for competition major in different fields in private universities in the United States. Buser, Peter, and Wolter (2017b) study the relationship between willingness to compete and educational choices among students of varying abilities. They consistently find that students of both genders who compete make different educational choices than students who do not compete at all points in the ability distribution. Lastly, Zhang (2019) finds that willingness to compete predicts whether middle school students in rural China take a highly demanding high school entrance exam. We extend the findings of these papers

[4] Other related work is that of Flory, Leibbrandt, and List (2015), Leibbrandt and List (2015), and Samek (2019), who demonstrate that jobs perceived as being more competitive affect the willingness of women to apply and negotiate salaries. Unlike the work reviewed here, these studies do not use individual measures of taste for competition.

by demonstrating that taste for competition predicts *actual* labor market outcomes in a considerably different sample of participants (our sample is older, better educated, more diverse, and specialized in business) and for an extended period of time.

A final related study is that of Berge et al. (2015), who find that a high taste for competition is associated with higher investments and profits by small-scale Tanzania's entrepreneurs. Besides studying a very different population, our study has one main advantage vis-à-vis this paper. Namely, we collected the earnings data years after we measured taste of competition and at two points in the careers of the business professionals. First at graduation, after a lengthy competitive recruitment process, but before they had to perform at work. Then, seven years later, when compensation is based on an evaluation of the employee's performance on the job. These longitudinal data allow us to investigate which determinants of earnings at graduation are persistent over time.

The rest of the paper is organized as follows. In Section I, we describe the various sources from which we collect our data. In section II we present descriptive statistics of our sample, including whether there are gender differences in taste for competition and compensation. In section III, we test the relationship between gender, taste for competition, and compensation at graduation. In Section IV we reevaluate these relationships with compensation 7 years after graduation. Finally, we further discuss our findings and conclude in Section V.

I. Study design

Our sample consists of the 2008 MBA cohort at the University of Chicago Booth School of Business. We rely on multiple sources of data of this specific cohort: an experiment and an initial survey conducted at the start of their MBA program, the school's administrative data, and a follow-up survey conducted seven years later.

I.A. Initial survey and experiment

As part of a required core class, all the MBA students of the 2008 cohort completed a survey and participated in an experiment designed to measure several individual-specific characteristics. We conducted both the survey and the experiment in the fall of 2006, during their first month in the business school. Participants completed the survey online before they took part in the experiment. The survey included questions on demographic characteristics as well as standard questionnaires of personality traits.

The experiment consisted of eight distinct parts. Participants were given the instructions for each part before the start of the respective part. They received no feedback concerning the outcome or behavior of others until the experiment had concluded. As compensation, participants received a $20 show-up fee and their earnings in a randomly selected part. On average, participants earned $99 for the 90-minute experiment. In the Online Appendix, we provide a detailed description of the

procedures used to conduct the survey and experiment as well as the instructions for the tasks used to measure taste for competition.[5]

To measure taste for competition, we use a variation of the design used by Niederle and Vesterlund (2007). Participants first performed an adding task under both a tournament payment scheme and a piece-rate payment scheme. Subsequently, they performed the task once again under a payment scheme of their choice. Their payment-scheme choice serves as the basis for their taste for competition.

The adding task consisted of computing sums of four two-digit numbers for 150 seconds. The computer randomly drew the two-digit numbers from a uniform distribution with a support of 11 to 99. Calculators were not allowed. After each answer, a new set of numbers appeared on the computer screen along with a message indicating whether their answer was correct or incorrect. Importantly, although participants knew what their own performance was, they did not receive any information about the performance or choices of others during the experiment.

We informed participants that this part of the experiment consists of four periods, one of which would be randomly chosen to determine their earnings. We also informed them that we randomly assigned them to groups of four. Participants read the instructions for each period just before the start of the respective period. In the first two periods, participants performed the addition task once under a piece-rate payment scheme and once under a tournament payment scheme. Under piece-rate, participants earned $4 for every correct answer. Under tournament, participants earned $16 for every correct answer if they had the highest number of correct answers in their group (ties were broken randomly) and earned $0 otherwise. Half the participants performed the addition task first under piece-rate and then under the tournament while the other half performed the tasks in the reverse order.

In the third period, we informed participants that they would perform the addition task once again and asked them to choose one of the two payment schemes to apply in that period. Participants who chose piece-rate earned $4 per correct answer. Participants who chose tournament, earned $16 per correct answer if they had more correct answers than their other group members had when they previously performed the task under the tournament payment scheme. Competing against their group members' past performance has the advantage that the participants' choice and effort in the third period is not affected by the (expected) choices of the other members of the group. The variable "competitive" is a dummy variable equal to 1 when an individual chooses tournament in this period.

In the fourth period, participants did not perform the adding task. In this period, they simply chose whether they wanted their earnings in the fourth period to be calculated based on their past

[5] We provide a detailed description of the other parts of the survey and experiment in Reuben, Sapienza, and Zingales (2008).

performance and either the piece-rate or the tournament payment scheme.[6] Thus, the participants' choice in the fourth period resembled their choice in the third period except that participants who chose the tournament did not perform under the stress (or thrill) one might experience in a competitive environment. The variable "non-competitive tournament" is a dummy variable equal to 1 when an individual chooses tournament in this period.

There are several reasons why participants may prefer a tournament payment scheme. First, they might correctly anticipate that they are a superior performer. Second, they might misperceive their performance and believe they are a superior performer when they are not. Third, they might love risk. Fourth, they might receive a special thrill from performing in a tournament. Following Niederle and Vesterlund (2007), we want to isolate the fourth component. For this reason, we need to construct measures of performance, overconfidence, and risk aversion.

To obtain an individual measure of performance, we compute the participants' average rank in the first and second periods. For this variable to not depend on the specific group matching that occurred in the experiment, we used the number of sums solved by the participants and simulated 1,000,000 matchings to obtain an average rank for each participant. Since average ranks are higher when performance is lower, for ease of interpretation, we define the variable "performance" as the negative of the average ranks.

After the fourth period, we elicited the participants' beliefs concerning their relative performance by asking them to guess how they ranked within their group in each of the first three periods. Participants submitted ranks between 1st and 4th and received $2 for each correct guess.[7] We use the participants' estimated ranks and their actual performance to calculate how overconfident they are. Specifically, the variable "overconfidence" is the difference between the actual average rank of an individual in the first two periods and their expected rank. Note that since a lower rank means higher performance, this variable is indeed greater when participants overestimate their performance.

To measure risk preferences, we gave participants 15 choices between a lottery with an expected value of $100 and a certain amount that ranged from $50 to $120. As is common in the literature, we then use these choices to determine each participant's risk aversion coefficient assuming a CRRA utility function (see Holt and Laury. 2002). The variable "risk aversion" is the CRRA risk aversion coefficient.

I.B. Administrative data

The admission office of the business school supplied us with the gender variable. The career services office of the business school provided us with information regarding the job participants accepted

[6] The participants' choice in the fourth period applied to their performance in the first or second period. Specifically, to the period they completed under the piece-rate payment scheme.

[7] In case of a tie, participants were paid the $2 if their guess corresponded to a rank they could have received when the tie was randomly resolved.

upon graduation. The participants initially reported this information, but the career services office subsequently double-checked it with the respective employers to ensure its accuracy. The information included data on earnings, which include salaries as well as yearly and one-off bonuses (e.g., sign-on, relocation, tuition, and retention at year-end bonuses). Based on this information, we calculated the participants' total earnings in their first year after graduation. The information also included the employers' names, which we used to classify them into three broad industry categories. Specifically, we used two-digit NAICS industry codes to classify each employer into finance (two-digit NAICS code 52), professional services, which we refer to as "consulting" (two-digit NAICS code 54), and "other" (the remaining two-digit codes). We also received from the career services office self-reported information from the participants, which included whether they obtained competing job offers.

I.C. The 2015 follow-up survey

At the end of 2015, we reached out to the same set of MBAs with a follow-up survey. The survey contained questions about their career, work-life balance, and degree of life satisfaction. More importantly, we asked them about their salary and their end of year bonus in 2014. Of the 409 original students who consented to the treatment of their data, 263 (64.3%) answered the follow-up survey.

II. Descriptive statistics

Although participation in some parts of the study was mandatory, participants had the option to opt-out of the study by not consenting to the use of some or all of their data. Out of the 550 students in the cohort, 409 (74%) provided information about their job in 2008 and consented to the analysis of the initial survey, experiment, and administrative data. Note that the decision to consent was made, even for the job placement, in September 2006, two years before the student graduated. Throughout the paper, we concentrate on these participants. However, it is important to understand whether this sample differs systematically from the rest of the cohort. For this reason, in the Online Appendix, we conduct a thorough comparison between the 409 participants in the sample and 129 participants for whom we can analyze data sources other than their job placement data.[8] By and large, we do not find differences between these two populations (see Table A.1 in the Online Appendix). Crucially for this paper, neither the fraction of women nor the fraction of participants who chose the tournament is significantly different (χ^2 tests, $p > 0.388$).[9] Similarly, to understand selection into the sample who responded to the 2015 follow-up survey, in Table A.2 in the Online Appendix, we compare the

[8] Of these 129 participants, we have compensation data for 26 participants who did not consent to the use of their job placement data and 36 who had job offers that were not reviewed by the school's career services office. For the remaining 67 participants, it is unclear whether they failed to report their job placement to the university, or they did not have a job offer.

[9] It is also the case that neither the fraction of men nor the fraction of women who chose the tournament significantly differ between the two populations (χ^2 tests, $p > 0.704$).

Table 1 – Summary statistics by gender

Note: Means, standard deviations, and number of observations for variables used in the paper. The rightmost column displays *p*-values from tests of equality of distributions between men and women (*t*-tests for ordinal variables and χ^2 tests for categorical variables).

	MEN			WOMEN			
	mean	s.d.	N	mean	s.d.	N	*p*-value
Experiment							
Competitive	0.60	0.49	286	0.33	0.47	123	0.000
Performance (rank in sums tasks)	2.39	0.78	286	2.70	0.73	123	0.000
Expected rank in sums tasks	2.11	0.76	286	2.54	0.71	123	0.000
Overconfidence	0.28	0.63	286	0.16	0.65	123	0.095
Risk aversion coefficient	4.22	4.19	286	5.94	4.69	123	0.001
Non-competitive tournament	0.47	0.50	286	0.25	0.44	123	0.000
Jobs data							
Total compensation in 2008	185.84	183.12	286	149.22	36.95	123	0.001
Base salary in 2008	107.71	18.88	286	105.91	15.68	123	0.318
Total bonus in 2008	78.12	176.26	286	43.31	28.45	123	0.001
One-off bonus in 2008	44.16	30.46	286	34.91	22.51	123	0.001
Expected performance bonus in 2008	33.96	168.98	286	8.40	17.33	123	0.012
Number of competing job offers	0.42	0.82	286	0.41	0.81	123	0.882
Fraction with job in finance in 2008	0.58	0.49	286	0.36	0.48	123	0.000
Fraction with job in consulting in 2008	0.20	0.40	286	0.34	0.48	123	0.000
Total compensation in 2015	346.93	231.91	189	228.87	180.59	61	0.000
Base salary in 2015	194.04	108.58	189	160.22	60.18	61	0.002
Performance bonus in 2015	152.89	185.70	189	68.66	143.69	61	0.000
Fraction with job in finance in 2015	0.48	0.50	189	0.18	0.39	61	0.000
Fraction with job in consulting in 2015	0.09	0.29	189	0.21	0.41	61	0.000

characteristics of the 263 respondents and the 146 nonrespondents who had consented to the analysis of their data.

Next, we provide descriptive statistics for participants in our sample and evaluate whether there are gender differences in the experimental, initial survey, and administrative data. Table 1 presents the mean and standard deviation for variables derived from these data sources for both the 286 men and 123 women in the sample. For each variable, the table also displays *p*-values from tests of equality of distributions between men and women based on *t*-tests for ordinal variables and χ^2 tests for categorical variables. In the experiment and initial survey, we replicate many of the gender differences reported in the literature (Croson and Gneezy, 2009). Next, we focus on the difference in taste for competition between male and female MBAs.

II.A. Gender differences in taste for competition

Consistent with the literature on taste for competition, Table 1 shows that 60% of men choose the tournament payment scheme compared to 33% of women. However, on its own, the higher incidence

Table 2 – Determinants of willingness to compete

Note: Regressions of the decision to enter the tournament in the third period of the experiment. Marginal effects from probit regressions and standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	I	II	III
Woman	–0.268***	–0.223***	–0.148**
	(0.051)	(0.055)	(0.060)
Performance		0.213***	0.351***
		(0.035)	(0.043)
Overconfidence			0.320***
			(0.050)
Risk aversion			–0.019***
			(0.006)
Obs.	409	409	409
χ^2 test	25.069***	63.677***	117.954***

of men choosing the tournament is not enough to conclude that men like to compete more than women do. In particular, Table 1 also reveals that men in our sample outperform women in the adding tasks (the average rank is 2.39 for men and 2.70 for women), and consistent with their higher performance, they expect to be better ranked than women (on average, 2.11 vs. 2.54). These differences, combined with the fact that women are more risk-averse, could explain why men choose the tournament more often than women do.

Do male MBAs like competition more than female MBAs after controlling for their ability, beliefs, and risk preferences? To answer this question, we follow Niederle and Vesterlund (2007) and run a series of probit regressions with the participants' choice of the tournament as the dependent variable. We report the resulting marginal effects in Table 2. In column I, the only independent variable is the participants' gender. Without any controls, the gender gap in choosing the tournament equals 26.8%. In column II, we control for the participants' performance, which reduces the gender gap in choosing the tournament by 4.5 percentage points to 22.3%. In column III, we further control for the participants' beliefs by including the variable overconfidence and for their risk preferences by including their risk-aversion coefficient. Performance, beliefs, and risk preferences are all significant determinants of the choice of tournament. Controlling for these variables still leaves a statistically significant gender gap of 14.8% in the decision to compete (column III). The coefficient of the gender dummy, once we control for performance, beliefs, and risk preferences, can be interpreted as a gender difference in "taste for competition."[10]

[10] This way of measuring taste for competition has recently come under scrutiny because measurement error in the control variables or an incorrectly specified regression can result in the overestimation of the effects of taste for competition (van Veldhuizen 2018; Gillen, Snowberg, and Yariv 2019). In subsection III.A of the Online Appendix, we run a series of robustness checks to test whether this result is susceptible to this problem. We do not find evidence that it is.

II.B. Compensation in 2008

The Booth career office collects data on the base salary and bonuses of all the graduating MBA students. For our analysis, we first consider total compensation, which is composed of base salary and bonus. In 2008, male MBAs received, on average, total compensation of $186K, which is 25% higher than their female graduates ($149K). In Table 1, we also report separate sample statistics for the base salary and the bonus pay. We group the various bonuses into two components: one-off bonuses (relocation, tuition, sign-on, and retention at year-end) and the rest, which are bonuses related to the employers' expected performance of their new hires (stock options, profit sharing, guaranteed performance, and other). We call this component the "expected performance bonus" because firms offer it before the MBAs begin to work, but it is linked to the performance of the firm, and it is likely to incorporate the employees' actual performance in the future. The descriptive statistics reveal that the gender differences are mostly concentrated in the bonus, not in the base salary. For example, the average overall bonus for men is 80% higher than for women. The difference is even starker in the expected performance component, where men's bonus is 404% higher than women's.

The large gender gap in total compensation is partly due to three male outliers, with salaries above $1M. If we ignore those, the average male total compensation drops to $170K, the gender gap to 14%, the average overall bonus for men becomes 44% higher than for women, and the expected performance bonus 222% higher for men compared to women.

II.C. Compensation in 2015

Our 2015 follow-up survey asks for their current salary and year-end performance bonus. We compute total compensation as the sum of the two. We will refer to it as 2015 compensation, even if it is technically the sum of the 2015 salary and 2014 realized bonus.

On average, women make $229K and men $347K (52% more). Unlike in 2008, in 2015, the average base salary of men is significantly higher than the base salary of women by a factor of 1.21. However, the largest difference is once again concentrated in the bonuses, where men's are larger than women's by a factor of 2.23. Eliminating outliers does not change the results much. Nevertheless, to avoid the risk that our results are driven by a few individuals, in our subsequent analysis, we windsorize the compensation data at the 1% and 99% level for both 2008 and 2015.

Although we find both in 2008 and 2015 that the largest gender gap occurs in the bonus component of pay, it is important to highlight that there is a big difference between the 2008 and 2015 bonuses. Bonuses in 2008 are one of the negotiated components during the recruiting process, while bonuses in 2015 are based on realized performance typically related to observable metrics set up in advance. We will discuss these differences in light of our results.

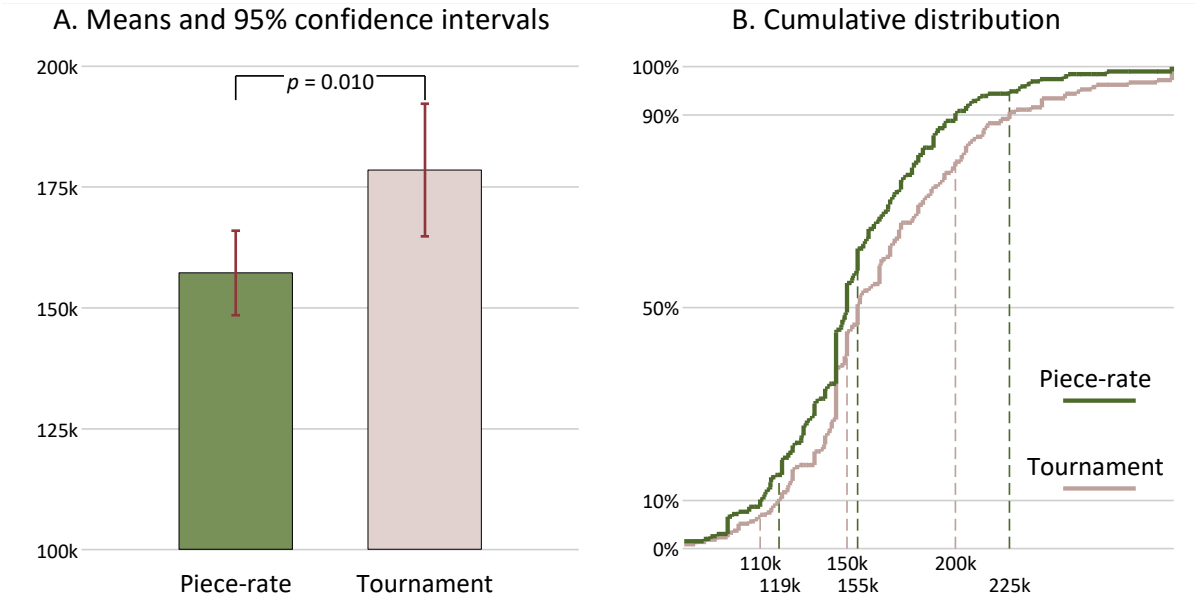

Figure 1 – Total compensation in 2008 depending on tournament choice

III. Taste for competition and compensation in 2008

In the previous section, we have shown that our sample exhibits a gender gap in wages and a gender difference in the taste for competition. In this section, we analyze how the two are related beginning with the compensation at graduation.

III.A. The effect of taste for competition

We start by looking graphically at the association between taste for competition and compensation. As we can see in Figure 1A, choosing the tournament in a laboratory experiment at the beginning of their MBA is associated with higher earnings two years later in the participants' first job. On average, participants who chose the tournament ended up earning $21K more than participants who chose piece-rate (*t*-test, $p = 0.010$). The difference in earnings is larger for the top earners (see Figure 1B).

Does this difference in earnings persist once we control for other determinants of choosing the tournament? To answer this question, in Table 3, we run a series of linear regressions with the log of the participants' total compensation in 2008 as the dependent variable.

In column I, the only explanatory variable is "competitive." Individuals who chose to compete earn approximately 9.3% more. In column II, we add three explanatory variables: overconfidence, risk aversion, and performance in the game, all measured as described in Section I. None of these additional variables is statistically significant, and adding them to the regression does not change the magnitude of the competitive dummy. With the inclusion of these control variables, we follow Niederle and Vesterlund (2007) and interpret the coefficient of the competitive dummy as representing the effect of "taste for competition."

Table 3 – Determinants of total compensation in 2008

Note: Regressions of the log of total compensation in 2008. OLS estimates and standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	I	II	III	IV	V	VI	VII	VIII
Competitive	0.093***	0.092**		0.079**	0.074**	0.075**		0.062*
	(0.031)	(0.036)		(0.036)	(0.031)	(0.036)		(0.036)
Woman			–0.117***	–0.107***			–0.112***	–0.104***
			(0.036)	(0.036)			(0.036)	(0.036)
Overconfidence		0.014	0.024	0.003		0.008	0.014	–0.002
		(0.029)	(0.027)	(0.029)		(0.029)	(0.027)	(0.029)
Risk aversion		0.000	0.000	0.002		0.000	0.001	0.002
		(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.004)
Performance		–0.004	0.006	–0.016		–0.004	0.004	–0.015
		(0.025)	(0.023)	(0.025)		(0.025)	(0.023)	(0.025)
Finance					0.128***	0.128***	0.125***	0.118***
					(0.038)	(0.039)	(0.038)	(0.038)
Consulting					0.127***	0.125***	0.144***	0.133***
					(0.044)	(0.045)	(0.044)	(0.044)
Obs.	409	409	409	409	409	409	409	409
R^2	0.021	0.022	0.032	0.044	0.050	0.051	0.064	0.071
F test	8.853***	2.312*	3.361***	3.686***	7.172***	3.598***	4.564***	4.359***

In column III, we repeat specification II with the gender dummy instead of the competitive dummy. Women make $18K (11.7%) less, and this difference is statistically significant. Given the tendency to wage compression at this stage of an MBA's career and that most companies have predetermined wages for newly hired MBAs, we find this result to be notable.

In column IV, we include both the competitive and gender dummies (as well as all the controls). Once we control for the taste for competition, the magnitude of the gender coefficient drops by around $2K (10% of the gender gap) but remains statistically significant. The coefficient for taste for competition remains positive and statistically significant: individuals who like to compete, earn $13K (7.9%) more than the rest.

Some industries tend to pay MBAs significantly more (Oyer, 2008). Thus, compensation can vary because of differences in the industry chosen by MBAs at graduation. Since one of the effects of taste for competition could be different sorting across industries, we initially chose not to control for industry to estimate the full effect of taste for competition on compensation. It is interesting, however, to check how the results change if we control for the industry chosen by the MBAs at graduation. This is what we do in columns V to VIII, where we repeat the specifications I to IV including industry fixed effects. As explained in Section I, we classify employers into three industries: finance, consulting, and the rest. Each industry was chosen by roughly a third of the MBAs. The coefficients

of both the competitive and gender dummies are only slightly smaller. Thus, industry sorting does not seem to be the main driver of the results.[11]

To better understand the relationship between compensation and taste for competition, we separate the base salary and the bonuses in Table 4. In column I, the dependent variable is the log of the base salary in 2008. The explanatory variables are the same as in Table 3. The results show that the competitive dummy does not affect the MBAs' base salary, nor does the gender dummy. Since not all MBAs receive a bonus, and we are estimating the regressions in logs, we opted for a two-step hurdle model to estimate first the impact of the independent variables on probability of getting the bonus (column II) and then on the magnitude of the bonus received (column III) (Cragg, 1971). Neither taste for competition nor gender predicts the probability of receiving a bonus, which is hardly surprising since almost everyone (92.9%) receives some form of bonus. By contrast, both the competitive and gender dummies correlate with the size of the bonus. MBAs with a higher taste for competition receive an $8K (15.8%) higher bonus and women receive an $18K (37.8%) lower bonus.

Next, we study the two bonus components separately.[12] The dependent variable in column IV is the probability of getting the one-off component of the bonus. Most MBAs (91.4%) received some one-off bonus, which might be why the selection equation does not show any significant coefficient. In column V, the dependent variable is the log of the one-off bonus. Interestingly, we find that the competitive dummy is not significantly associated with the one-off bonus. One possible explanation is that this bonus does not vary much across individuals. However, this is not true: the one-off bonus is $25K at the 25th percentile and $55K at the 75th percentile, an interquartile range of $30K, which is similar to that of the expected performance bonus ($37K). Furthermore, we do observe a sizeable negative effect for women: on average, they receive a $9K (24.4%) lower one-off bonus.

In the next two columns, we repeat the hurdle model for the expected performance bonus. Only 37.4% of the MBAs received this bonus. Nevertheless, the probability of receiving it is not correlated with any of our explanatory variables (Column V). By contrast, the magnitude of this bonus is highly correlated with taste for competition and gender (Column VI). MBA students with a higher taste for competition receive a $13K higher expected performance bonus, while women receive a $10K lower bonus.

[11] In the Online Appendix, we report the results of two other robustness checks. In Table A.5, we evaluate whether we are overestimating the effect of taste for competition due to potential measurement errors in the control variables (van Veldhuizen 2018; Gillen, Snowberg, and Yariv 2019). In Table A.6, we repeat our basic specification adding a large set of individual controls to the regression (following Bertrand, Goldin, and Katz 2010). In both cases, we find very similar results.

[12] As previously described, we group the various bonuses into two components: one-off bonuses (relocation, tuition, sign-on, and retention) and expected performance bonuses (stock options, profit sharing, guaranteed performance, and other). As a robustness test, we dropped other bonuses from the latter category. The results are largely unchanged (see Table A.8 in the Online Appendix).

Table 4 – Taste for competition and different 2008 compensation measures

Note: Regression of the log of the base salary in 2008 in column I. Hurdle model of the likelihood of receiving a bonus in column II and its magnitude in column III. Hurdle model of the likelihood of receiving a one-off bonus in column IV and its magnitude in column V. Hurdle model of the likelihood of receiving an expected performance bonus in column VI and its magnitude in column VII. Linear estimates in columns I, III, V, and VII. Marginal effects in columns II, IV, and VI. Regressions in Panel A do not include industry fixed effects while those in Panel B do. Standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	Base	Total bonus		One-off bonus		Exp. perform bonus	
	salary	Received	Amount	Received	Amount	Received	Amount
	PANEL A: WITHOUT INDUSTRY FIXED EFFECTS						
	I	II	III	IV	V	VI	VII
Competitive	0.022	0.015	0.158***	0.024	0.044	0.010	0.571***
	(0.017)	(0.033)	(0.079)	(0.036)	(0.073)	(0.056)	(0.211)
Woman	–0.010	0.032	–0.378***	0.035	–0.244***	–0.073	–0.499**
	(0.017)	(0.027)	(0.079)	(0.029)	(0.072)	(0.056)	(0.231)
Overconfidence	0.003	0.024	–0.051	0.013	–0.043	–0.023	0.176
	(0.013)	(0.026)	(0.064)	(0.027)	(0.058)	(0.046)	(0.173)
Risk aversion	0.003*	–0.003	–0.000	–0.003	–0.013*	–0.004	0.028
	(0.002)	(0.003)	(0.008)	(0.003)	(0.007)	(0.006)	(0.023)
Performance	–0.005	0.007	–0.076	–0.016	–0.064	0.010	–0.065
	(0.012)	(0.022)	(0.055)	(0.022)	(0.050)	(0.039)	(0.148)
Obs.	409	409	380	409	374	409	153
F test / χ^2 test	0.975	3.705	31.981***	3.916	18.800***	3.540	16.286***
	PANEL B: WITH INDUSTRY FIXED EFFECTS						
	I	II	III	IV	V	VI	VII
Competitive	0.009	0.013	0.124*	0.019	0.007	0.035	0.478**
	(0.015)	(0.033)	(0.075)	(0.036)	(0.066)	(0.058)	(0.215)
Woman	–0.035**	0.027	–0.300***	0.033	–0.147**	–0.115**	–0.473**
	(0.015)	(0.027)	(0.076)	(0.030)	(0.066)	(0.058)	(0.231)
Overconfidence	–0.002	0.023	–0.058	0.012	–0.048	–0.021	0.159
	(0.012)	(0.026)	(0.060)	(0.027)	(0.052)	(0.047)	(0.173)
Risk aversion	0.001*	–0.004	0.005	–0.004	–0.007	–0.007	0.029
	(0.002)	(0.003)	(0.008)	(0.003)	(0.007)	(0.006)	(0.023)
Performance	0.000	0.008	–0.081	–0.015	–0.074*	0.013	–0.060
	(0.010)	(0.022)	(0.051)	(0.022)	(0.045)	(0.040)	(0.146)
Finance	–0.031*	–0.017	0.540***	0.006	0.620***	–0.296***	0.389*
	(0.016)	(0.031)	(0.081)	(0.033)	(0.071)	(0.064)	(0.231)
Consulting	0.140***	0.022	0.172*	0.040	0.137*	–0.104	0.350
	(0.019)	(0.040)	(0.093)	(0.043)	(0.082)	(0.072)	(0.249)
Obs.	409	409	380	409	374	409	153
F test / χ^2 test	17.282***	4.992	86.274***	5.033	106.100***	28.058***	19.912***

In the bottom panel of Table 4, we re-estimate all the specifications, controlling for industry fixed effects. The effects of taste for competition remain largely the same. For gender, we find a somewhat

lower but still highly statistically significant effect on the magnitude of the one-off bonus. Moreover, after controlling for industry, we see that women are 11.5% less likely to receive an expected performance bonus.

III.B. Robustness: Taste for competition or taste for high rewards

A clever feature of the experimental design of Niederle and Vesterlund (2007) is that participants make two choices between tournament and piece-rate. In the third period, participants perform under the chosen payment scheme while in the fourth period, the payment scheme is simply applied to their past performance (see Section I). Because it does not include performing in a competitive environment, Niederle and Vesterlund (2007) argue that this latter choice between piece-rate and tournament is unaffected by the participants' taste for competition, and is determined by preferences for highly non-linear payoffs that reward high performers. In Table A.7 in the Online Appendix, we replicate the analysis in Tables 3 and 4 adding as an explanatory variable a dummy equal to one if an individual chooses tournament in the fourth period. Adding this variable enables us to test whether the effect of the "competitive" variable in Tables 3 and 4 is driven by a taste for competition or a "taste for high rewards."

The taste-for-high-reward variable always has a small coefficient that is statistically not different from zero. By contrast, the coefficients of the competitive dummy remain substantially unchanged in all specifications. These results provide compelling evidence that the association between tournament and compensation is indeed driven by the participants' taste for competition and is not related to the choice of tournament pay *per se*.

III.C. Why does taste for competition matter?

In this section, we study why a higher taste for competition is associated with higher compensation. One possibility is that MBAs with a high taste for competition are simply better at generating higher salary offers through negotiation. Another possibility is that firms expect MBAs with a higher taste for competition to add more value. We test the first hypothesis empirically in Table 5.

The average MBA receives only 0.4 competing offers at graduation, and 73.1% of MBAs receive none. It is reasonable to expect that MBAs who receive multiple offers can extract more rents through negotiation. Given the highly competitive nature of the MBA recruiting process, it also seems plausible that MBAs with a higher taste for competition can generate more offers. We test these predictions in Table 5.

To test the effect of multiple offers on compensation, in columns I and II, we rerun regressions IV and VIII of Table 3 of the log of total compensation in 2008, adding as an explanatory variable a dummy equal to one if the MBA received at least one competing job offer. MBAs who generate competing offers do indeed earn around $16K (10.1%) more. The coefficients of the competitive dummy, however, slightly increase with the inclusion of the competing offers dummy. We also check

Table 5 – Taste for competition and competing job offers

Note: OLS regressions of the log of total compensation in 2008 in columns I and II. Marginal effects from negative binomial regressions of the number of competing job offers in 2008 in columns III and IV. Standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	Total compensation		# competing offers	
	I	II	III	IV
Competitive	0.083**	0.066*	–0.004	0.015
	(0.035)	(0.035)	(0.098)	(0.092)
Woman	–0.103***	–0.095***	–0.059	–0.111
	(0.035)	(0.035)	(0.094)	(0.087)
Overconfidence	0.012	0.009	–0.098	–0.094
	(0.029)	(0.028)	(0.082)	(0.078)
Risk aversion	0.002	0.002	0.009	0.006
	(0.004)	(0.004)	(0.010)	(0.009)
Performance	–0.014	–0.013	–0.051	–0.034
	(0.025)	(0.024)	(0.074)	(0.069)
Competing job offer	0.101***	0.128***		
	(0.035)	(0.035)		
Finance		0.142***		–0.371***
		(0.044)		(0.115)
Consulting		0.128***		–0.002
		(0.035)		(0.106)
Obs.	409	409	409	409
F test / χ^2 test	4.532***	5.571***	2.875	21.559***

whether individuals with a taste for competition generate more competing job offers. In columns III and IV of Table 5, we run a negative binomial regression of the number of competing offers each MBA got on the same explanatory variables we have been using so far. The results show that neither taste for competition nor gender predict the number of competing offers. Thus, we can exclude that generating multiple job offers is the source of the association between taste for competition and higher earnings.

Hence, the evidence so far is more consistent with firms expecting a higher average performance from employees with a higher taste for competition and setting total compensation based on this expectation. There are various plausible reasons why employers in business might value employees who have a taste for competition. For instance, these employees might perform better in competitive or stressful situations (Gneezy, Niederle, and Rustichini 2003; Apesteguia and Palacios-Huerta 2010) or might be easier to retain in competitive industries. However, the experimental evidence of Niederle and Vesterlund (2007), as well as in this paper, suggest that rewarding individuals only based on their willingness to compete could be a mistake. While individuals who choose the tournament

payment scheme are likely to have a taste for competition, they are also likely to be overconfident, which is, by definition, a suboptimal trait.

The MBA recruiting process is a long courtship that lasts six months, involving corporate conversations, networking nights, pre-interview one-to-one meetings, and several rounds of formal interviews.[13] During this process, it is plausible that recruiters can observe competitive behavior. However, since recruiters do not have access to our data, it is unlikely that they can separate those who compete because they are overconfident from those who compete because they have a high taste for competition. If employers value a high taste for competition but are also aware that they cannot separate it from a trait like overconfidence, they should expect that hiring individuals based on their competitive behavior will also result in a higher variance in performance. These conjectures are consistent with our results so far since overconfidence is not a significant determinant of compensation in 2008, and the reward for having a high taste for competition is concentrated on the expected performance bonus rather than on the base salary.

This line of reasoning also suggests that the association between overconfidence, taste for competition, and compensation might change over time. As employees build a track record, it is more likely that employers can discriminate these two traits and reward them differently. Also, over time, bonuses are typically based on *realized* rather than expected performance. Thus, if realized performance is affected negatively by overconfidence, the realized bonus will be showing a correlation with this trait, even if the company cannot assess this and other characteristics. We can explore these hypotheses by studying the relationship between taste for competition and compensation in 2015, which includes the 2014 realized bonuses.

IV. Taste for competition and compensation in 2015

In Table 6, we study the relationship between taste for competition and overall compensation, base salary, and bonuses in 2015. In columns I to IV, we do not control for industry, while in columns V to VIII, we repeat the same specifications controlling for industry fixed effects.

In columns I and V, we regress the log of total compensation in 2015 on the competitive and gender dummies and the controls. Compared to the coefficients from 2008, the coefficient of the competitive dummy in 2015 drops by half and is no longer statistically different from zero. It is even smaller when we control for industry fixed effects. To check whether this change is due to sample size, given that only 61% of the sample answered to the 2015 follow-up survey, in the Online Appendix, we re-estimate the regressions for the compensation in 2008 solely for the sample of MBAs for whom we have 2015 data (see Table A.11). The results show that the coefficient of the taste-for-competition variable is roughly the same as in the full sample, but it is not statistically different

[13] The structure of this recruiting process is similar to the one adopted at the undergraduate level to recruit business professionals in prestigious consulting firms, investment banks, and technology firms.

Table 6 – Determinants of compensation in 2015

Note: Regressions of the log of total compensation in 2015 in columns I and V and of the log of base salary in 2015 in columns II and VI. Hurdle model of the likelihood of receiving a bonus in columns III and VII, and of its magnitude (in logs) in columns IV and VIII. Linear estimates in columns I, II, IV, V, VI, and VIII. Marginal effects in columns III and VII. Standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	Total	Base	Bonus		Total	Base	Bonus	
	income	salary	Received	Amount	income	salary	Received	Amount
	I	II	III	IV	V	VI	VII	VIII
Competitive	0.035	0.003	0.003	0.085	0.001	–0.008	–0.007	0.030
	(0.098)	(0.066)	(0.047)	(0.195)	(0.089)	(0.064)	(0.048)	(0.172)
Woman	–0.384***	–0.194***	–0.002	–0.986***	–0.218**	–0.142**	0.026	–0.623***
	(0.103)	(0.069)	(0.049)	(0.205)	(0.097)	(0.070)	(0.051)	(0.188)
Overconfidence	–0.128	–0.082	–0.101***	–0.027	–0.133*	–0.087*	–0.104***	–0.083
	(0.081)	(0.054)	(0.037)	(0.161)	(0.073)	(0.053)	(0.038)	(0.143)
Risk aversion	–0.024**	–0.012*	–0.005	–0.026	–0.028***	–0.013**	–0.007	–0.035**
	(0.010)	(0.007)	(0.005)	(0.020)	(0.009)	(0.006)	(0.005)	(0.018)
Performance	–0.048	–0.056	–0.008	–0.050	–0.012	–0.046	–0.001	0.038
	(0.068)	(0.046)	(0.032)	(0.133)	(0.062)	(0.045)	(0.035)	(0.118)
Finance					0.632***	0.256***	0.110**	1.290***
					(0.084)	(0.060)	(0.053)	(0.162)
Consulting					0.284***	0.221**	0.016	0.395
					(0.123)	(0.089)	(0.064)	(0.241)
Obs.	250	250	250	218	250	250	250	218
F test / χ^2 test	5.205***	2.958**	10.051*	30.871***	12.708***	5.109***	28.058***	104.120***

from zero. Thus, in the 2015 sample, we certainly have a power issue, yet this is not the only reason why taste for competition is not statistically significant with 2015 compensation. Keeping the same sample, taste for competition seems to have less of an impact on compensation in 2015 than in 2008.[14]

Another difference with the results from 2008 is the coefficient on overconfidence. In 2008, the size of the coefficient was basically equal to zero (less than 1%). In 2015, the absolute size of the coefficient increases to 12.8% and 13.3%, depending on whether we control for industry fixed effects, and it is marginally significant. This change is consistent with our hypothesis that employers were not able to link salaries to overconfidence in 2008 but might be able to so in 2015.

[14] One might still worry that these results are driven by selection of respondents in the 2015 survey relative to the 2008 sample. To study this possibility, we also exploit the fact that some individual characteristics of these students predict their attachment to the University (and the willingness to spend time filling a survey) and their tendency to value time. Thus, in the Online Appendix, we present estimates of a Heckman selection model where we first estimate the marginal effect of the probability of answering the survey and then a linear model of the total compensation in 2015. The results remain substantially unchanged.

The gender dummy is now much larger than in 2008: the coefficient more than tripled, from 10.7% to 38.4% (or from 10.4% to 21.8%, controlling for industry fixed effects), implying an increase in the gender gap from $17K to $89K (or from $16K to $53K with industry fixed effects).

In columns II and VI, we repeat the same specifications for the log of the base salary. The results show a statistically and economically insignificant effect of taste for competition. Overconfidence has a borderline negative and significant effect. The gender gap is $31K (19.4%) or $23K (14.2%) with industry fixed effects, which is much higher than the 2008 gender gap in base salary of around $2K.

In the remaining columns, we run a two-step hurdle model to estimate, in the first stage, the probability of getting a bonus (columns III and VII of Table 6), and in the second stage, the log of the bonus received (columns IV and VIII). Note that, on average, the bonus was $132K, and 87% of the sample received at least some bonus. Neither taste for competition nor gender predicts the probability of receiving a bonus, while overconfidence has a negative and strongly significant effect. When we look at the magnitude of the bonus, we find that neither taste for competition nor overconfidence is economically or statistically significant. By contrast, we find that gender has a powerful effect: on average, women receive $60K less. In part, this effect is due to industry selection. When we control for industry, the effect drops to $41K.

How is it possible that taste for competition affects MBA earnings at graduation, but not seven years later? As mentioned before, taste for competition might be a valuable trait only when it is not combined with overconfidence. Overconfident employees who are eager to compete because they mistakenly think they are going to win will likely end up losing money for their employers. Thus, employers would like to hire and reward only MBAs who like competition but are not overconfident.[15] Unfortunately, employers are unlikely to observe the degree of overconfidence of potential employees: they must see them in action. Therefore, if they want to attract employees who like competition, employers have to offer a higher *expected* bonus to all "competitive" MBAs at the beginning of their career. Over time, employers could learn the degree of overconfidence of their competitive employees and start to reward only those who are not overconfident, penalizing the others. What is more, even if overconfidence remains unobservable, as long as employers can condition bonuses on observed performance and performance is negatively affected by overconfidence, we would observe a negative correlation between the realized bonus and overconfidence. This hypothesis is consistent with the fact that overconfidence (by itself) has no impact on compensation in 2008 but has a negative effect in 2015.

[15] Overconfidence may be less of an issue for employees who do not have a taste for competition. Their aversion to competition means that they will take fewer risks and therefore the overestimation of their abilities is bound to be less costly to employers.

Table 7 – Interaction with overconfidence

Note: Regressions of the log of total compensation in 2015 in columns I and V and of the log of base salary in 2015 in columns II and VI. Hurdle model of the likelihood of receiving a bonus in columns III and VII, and of its magnitude (in logs) in columns IV and VIII. Linear estimates in columns I, II, IV, V, VI, and VIII. Marginal effects in columns III and VII. Standard errors in parenthesis. ***, **, and * indicate statistical significance at 0.01, 0.05, and 0.10.

	Total income	Base salary	Bonus		Total income	Base salary	Bonus	
			Received	Amount			Received	Amount
	I	II	III	IV	V	VI	VII	VIII
Competitive	0.120	0.040	0.025	0.214	0.064	0.018	0.013	0.125
	(0.103)	(0.070)	(0.049)	(0.200)	(0.094)	(0.068)	(0.048)	(0.177)
Woman	−0.391***	−0.197***	−0.004	−1.008***	−0.226**	−0.146**	0.022	−0.645***
	(0.102)	(0.069)	(0.048)	(0.203)	(0.097)	(0.070)	(0.044)	(0.187)
Overconfidence	0.017	−0.018	−0.063	0.245	−0.027	−0.042	−0.064	0.117
	(0.098)	(0.067)	(0.054)	(0.194)	(0.089)	(0.065)	(0.052)	(0.173)
Overconfidence	−0.350**	−0.152	−0.080	−0.678**	−0.254**	−0.108	−0.074	−0.494**
× competitive	(0.137)	(0.093)	(0.064)	(0.278)	(0.125)	(0.091)	(0.063)	(0.247)
Risk aversion	−0.023**	−0.012*	−0.005	−0.025	−0.027***	−0.013**	−0.006	−0.035**
	(0.010)	(0.007)	(0.004)	(0.020)	(0.009)	(0.006)	(0.004)	(0.017)
Performance	−0.077	−0.069	−0.018	−0.097	−0.034	−0.055	−0.010	0.003
	(0.068)	(0.046)	(0.033)	(0.133)	(0.062)	(0.045)	(0.032)	(0.118)
Finance					0.614***	0.248***	0.091**	1.258***
					(0.084)	(0.061)	(0.041)	(0.161)
Consulting					0.267**	0.213**	0.014	0.363
					(0.123)	(0.089)	(0.071)	(0.239)
Obs.	250	250	250	218	250	250	250	218
F test / χ^2 test	5.519***	2.923***	12.150*	37.653***	11.774***	4.655***	17.100**	110.015***

To test this hypothesis, in Table 7, we re-estimate the specifications of Table 6, adding an interaction between taste for competition and overconfidence. Consistent with our hypothesis, we find that the interaction between taste for competition and overconfidence has a negative and significant effect on salary. This effect is economically large and is visualized in Figure 2, where we report the estimated marginal effect of taste for competition on total compensation (in thousands of USD) and the 90% confidence intervals at different levels of overconfidence. Points to the right of the dotted line correspond to overconfident individuals. Among MBAs whose degree of overconfidence is one standard deviation below the mean, having a high taste for competition implies $74K (25.8%) higher earnings. By contrast, among MBAs whose degree of overconfidence is one standard deviation above the mean, having a high taste for competition implies $44K (18.6%) lower earnings. Table 7 and Figure 2 also show that the interaction between taste for competition and overconfidence is more prominent in the bonus component of the MBAs' earnings.[16]

[16] Like before, in the Online Appendix, we test whether these results are robust to adding a large set of individual controls (Table A.9) and to the use of a Heckman selection model to correct for the selection of respondents into the 2015 follow-up survey (Table A.10). The results remain substantially unchanged.

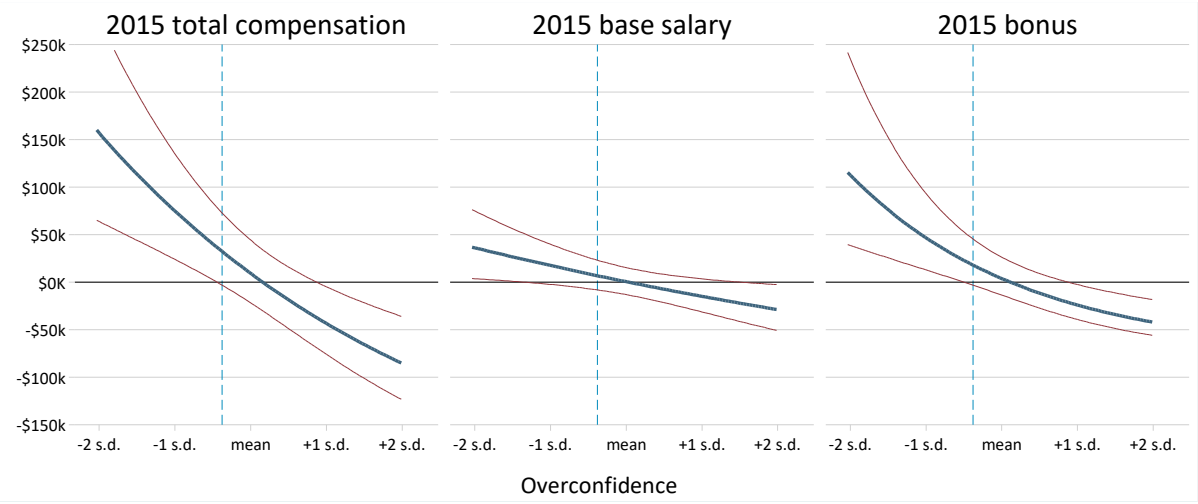

Figure 2 – Estimated marginal effect of taste for competition on total compensation in 2015 (in thousands of USD) and 90% confidence intervals at different levels of overconfidence. Points to the right of the dotted line correspond to overconfident individuals.

In unreported regressions, we repeated the same specifications with the 2008 data. The interaction between taste for competition and overconfidence is both economically and statistically indistinguishable from zero, suggesting that our interpretation that companies learn only over time the degree of overconfidence of their employees or that performance indirectly reveals overconfidence is a plausible one.

In conclusion, the evidence is most consistent with a higher taste for competition being a positive characteristic only in the absence of overconfidence. When employers are unable to observe overconfidence, they are willing to compensate all "competitive" MBAs with a higher pay-for-performance. Once bonuses are paid based on realized performance, only competitive MBAs who are not overconfident are rewarded.[17]

V. Conclusions

In this paper, we study whether gender differences in taste for competition can explain the observed gender gap in wages among MBAs. We find that taste for competition, as measured by a laboratory experiment, positively predicts wages. We also find that, on average, men exhibit a higher taste for competition. Nevertheless, we find that taste for competition explains only 10% of the gender gap at graduation and none seven years later.

[17] One can interpret our results regarding risk aversion similarly. It could be that, given the recruitment process, employers cannot observe attitudes toward risk early on, resulting in a nonexistent correlation between risk aversion and compensation in 2008. Over time, irrespective of whether employers directly observe risk aversion, the negative association between risk aversion and compensation can be the result of a negative relationship between risk aversion and performance. That being said, for risk aversion, it is also plausible that the lower compensation of risk-averse individuals is driven by self-selection into lower-paying but less risky jobs over time.

We explore possible explanations for the correlation between taste for competition and earnings. We do not find evidence that "competitive" MBAs are better at generating multiple offers, which can boost their salaries. Our evidence is consistent with the hypothesis that employers consider taste for competition to be a valuable trait because it can boost performance, but only when it is not associated with overconfidence. We find that the taste for competition is linked to the variable component of earnings, bonuses. At graduation, bonuses are set in advance, without knowledge of effective performance. Recruiters, unable to observe overconfidence before hiring, reward all competitive MBAs at graduation with higher expected bonuses. Seven years later, bonuses are based on realized performance. Hence, over time, only the non-overconfident MBAs are rewarded for being competitive through higher realized bonuses, while the overconfident MBAs are penalized.

These results could be explained in two different ways: either employers learn over time the characteristics of workers and tie compensation to those characteristics, or the correlation emerges simply because these characteristics affect performance, which is used to set bonuses ex-post. Unfortunately, with our current data, we are unable to distinguish between these two explanations.

These results can also explain why taste for competition explains less of the gender gap as we move from compensation based on expected performance to compensation based on realized performance. Men like to compete more, but they are also more overconfident. Thus, initially, men get rewarded more as firms cannot observe overconfidence, and workers have yet to perform. Over time, as overconfidence and performance are revealed, men get penalized more, eliminating this component of the gender gap. Indeed, one of the main advantages of our framework is that we observe two "types" of compensations: early on, when compensation is more likely to be based on expected performance, and later on, when salaries and bonuses are more likely to be based on realized performance (particularly bonuses). This result is especially important to evaluate potentially naïve policy implications that suggest that women should "change" and become more competitive (on this point, see also Niederle, 2017).

A few words of caution are warranted when thinking about the external validity of our results. In this paper, we study young professional careers. The recruiting process for MBAs involves a complicated competitive process where recruiting firms meet candidates through social mixers, presentations, and several rounds of formal interviews. Since this recruiting process is particularly competitive, our results may have limited external validity in other professions. Because our sample is non-representative, future research is needed to understand whether these results extend to the general population. However, while we focus on MBAs, many sought-after jobs share a protracted recruitment process that is very similar (especially for jobs in consulting, banking, and some of the STEM fields).

Our paper contributes to the growing literature linking measurable characteristics in the lab with relevant labor-market outcomes. Compared to other studies, our work highlights the importance of

measuring the effect of lab-generated measures over time as their relationship with labor-market outcomes can vary over people's careers. In our sample of young business professionals, the lab-generated measure of taste for competition plays an important role during the recruiting phase, presumably, when few other characteristics are observable to recruiters. To the extent that employers can observe some of these traits over time or that performance is correlated with these traits, performance-based compensation is more likely to correlate with characteristics previously measured in the lab that are unobservable to recruiters.

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