

The Impact of Gender Composition on Team Performance and Decision-Making: Evidence from the Field*

Jose Apestequia

Ghazala Azmat

Nagore Iriberry[†]

Management Science, forthcoming

February, 2011

Abstract

We investigate whether the gender composition of teams affect their economic performance. We study a large business game, played in groups of three, where each group takes the role of a general manager. There are two parallel competitions, one involving undergraduates and the other involving MBA students. Our analysis shows that teams formed by three women are significantly outperformed by all other gender combinations, both at the undergraduate and MBA levels. Looking across the performance distribution, we find that for undergraduates, three women teams are outperformed throughout, but by as much as 0.47 of a standard deviation of the mean at the bottom and by only 0.09 at the top. For MBA students, at the top, the best performing group is two men and one woman. The differences in performance are explained by differences in decision-making. We observe that three women teams are less aggressive in their pricing strategies, invest less in R&D, and invest more in social sustainability initiatives, than any other gender combination.

Keywords: Gender; Teams; Performance; Decision-Making.

JEL Classification Numbers: D03; D21; J16.

* We are grateful to *L'Oréal* and *StratX* for their collaboration and assistance in this study. We thank Manuel Arellano, Miguel A. Ballester, Manel Baucells, Vicente Cuñat, Rachel Croson, David Dorn, Gabrielle Fack, Robin Hogarth, Pedro Rey-Biel, and Kurt Schmidheiny for helpful comments. Ozan Eksi and Jacopo Ponticelli provided excellent research assistance. Financial support by the Spanish Commission of Science and Technology (ECO2008-06395-C05-01, ECO2008-01768, ECO2009-12836, ECO2010-09555-E, ECO2009-11213 and SEJ2007-64340), Fundación Rafael del Pino, the Barcelona GSE research network, and the Government of Catalonia is gratefully acknowledged.

[†] Jose Apestequia: ICREA, Universitat Pompeu Fabra and Barcelona GSE. Ghazala Azmat: Universitat Pompeu Fabra and Barcelona GSE. Nagore Iriberry: Universitat Pompeu Fabra and Barcelona GSE. E-mails: jose.apestequia@upf.edu, ghazala.azmat@upf.edu, and nagore.iriberri@upf.edu.

1. Introduction

Gender differences and their impact on economic outcomes have attracted increasing attention, both in the media and in the economic literature. There is evidence for systematic differences in the origins of choice and behavior by gender; namely, in the preferences of men and women. Croson and Gneezy (2009), in a comprehensive and exhaustive review of the work on gender differences in economic experiments, summarize the findings as follows: “We find that women are indeed more risk-averse than men. We find that the social preferences of women are more situationally specific than those of men; women are neither more nor less socially oriented, but their social preferences are more malleable. Finally, we find that women are more averse to competition than are men.”¹

The gender difference in risk attitudes, social preferences and preferences over competitive environments, has important implications for the understanding of differences in economic and social outcomes. Two prominent issues that have recently been connected to gender differences in preferences are the gender gap in labor markets (Bertrand and Hallock, 2001, Bertrand et al., 2010, Manning and Swaffield, 2008) and the influence of women in human development (Miller, 2008).

The studies on gender differences are most commonly done at the individual level, despite the fact that important decisions in modern economies are often taken by groups or teams. Committees and boards, business-partners, and even industrial and academic research groups are only a few examples of group decision-making in the real-world. Interestingly, the recent financial crisis has brought media attention to the gender composition of boards, and its influence on the firms’ performance.² The extrapolation of the findings at the individual level to the group level is not, however, immediately apparent. It is well-known that groups have their own idiosyncrasy. For example, a widely documented phenomenon is group polarization, whereby groups make more extreme decisions than the average of the individual views in the group.³ Therefore, the influence of gender on group performance and decision-making deserves greater attention. This is the focus of this paper.

¹ See also Andreoni and Vesterlund (2001), Byrnes et al. (1999), Charness and Gneezy (2007), Croson and Buchan (1999), Gneezy et al. (2003), and Niederle and Vesterlund (2007).

² See for example the article “Crisis gives women a shot at top corporate jobs” by Lamia Walker in the Financial Times on the 18th of October of 2008, and the article “Mistresses of the Universe” by Nicholas D. Kristof in the New York Times on 7th of February of 2009.

³ See Stoner (1968). See also Sobel (2008) for a theoretical account and for references to the empirical literature. For other established differences between individuals and teams see, e.g., Charness and Jackson (2007) and Charness et al. (2007).

Dufwenberg and Muren (2006) are a prominent exception in the experimental economics literature, studying the influence of gender composition on group decisions. In a dictator game setting, they find that groups are more generous and equalitarian when women are the majority. They also find that the most generous groups are those with two men and one woman. In the field, Bagues and Esteve-Volart (2010) show that the chances of success of female (male) candidates for positions in the Corps of the Spanish Judiciary are affected by the gender composition of their evaluation committees. They find that female candidates have better chances of success the more males in the committees (see also Zinovyeva and Bagues, 2009). Delfgaauw et al. (2009) study the interaction between the managers' gender and the gender composition among the workers. They find that sales competition is effective only in stores where the store's manager and a large fraction of the employees have the same gender. Finally, there are also empirical papers in finance that document a positive relationship between gender diversity in boardrooms and company performance. However, reverse causality is a pervasive problem in these studies, since companies that perform better are quite likely to be companies that also focus more on the gender diversity of their boards (see Carter et al. 2003, Farrell and Hersch, 2005, and Adams and Ferreira, 2009).

In this paper, we explore the influence of the team gender composition on economic performance. We study a large online business game, the *L'Oréal E-Strat* game, which is played by groups of three. Teams play the role of a general manager of a beauty-industry company, competing in a market composed by four other simulated companies. There are two identical competitions occurring in parallel, one involving undergraduate students and the other involving MBA students. The *L'Oréal E-Strat* game was designed to simulate real business decisions, and hence, teams must take decisions related to brand management, research and development (R&D), and corporate responsibility initiatives. The winning teams receive a 10,000 euros prize, plus a paid trip to Paris. Perhaps even more importantly, winning candidates have the possibility of being hired by L'Oréal. Our database consists of the last three editions of the *L'Oréal E-Strat* business game, from the years 2007, 2008 and 2009, yielding a total of 37,914 participants, organized into more than 16,000 teams from 1,500 different universities that are located in around 90 different countries around the world.

L'Oréal E-Strat offers a unique setting to study the influence of the gender composition of teams on performance and on decision-making. First, it is played worldwide, by a large number of individuals, coming from a large number of different

institutions. Second, there are two separate competitions, involving two different subject pools, undergraduate and MBA students. Each subject pool constitutes relevant samples to study the influence of gender composition of teams. The former represents a subject pool that is close to the one typically used in the experimental economics literature. This may facilitate comparisons of established results at the individual level, with new findings that emerge here at the group level. MBA students are also relevant as they represent a unique and important sample. These are subjects that, with a high probability, will play a key role in real-world business management. Hence, it is relevant to understand how these subjects interact in groups, conditioning on the gender composition in teams. Third, we can study the effect of the gender composition on performance and on other important aspects such as specific business decisions. Fourth, as mentioned, the game aims to simulate the business environment as close as possible to the real-world. Finally, this study also offers an important advantage over existing empirical studies. In particular, here reverse causality is less of a concern. Teams are formed before their performance and, more importantly, teams remain fixed over the entire game.

Our analysis shows that teams formed by three women are significantly outperformed by any other gender combination, both at the undergraduate and MBA competitions. The magnitudes are sizable, about 0.18 of a standard deviation from the mean for the undergraduate students and about 0.17 for the MBA students. We show that these findings are robust after controlling for a number of important variables, such as the quality of the institutions, fields of study, and the geographical areas.

When we extend our analysis to consider the distributional effects, we find that the performance of three women teams shows interesting variations along the distribution. In the undergraduate competition, while the underperformance of three women teams remains significant along the entire distribution, there is a marked decrease as we move to the right on the performance distribution. Among the lowest 10 percent, three women teams are outperformed by as much as 0.47 of a standard deviation from the mean, while at the top 20 percent, three women teams are outperformed by only 0.09. We also find evidence that the optimal gender composition along the whole distribution is that of two men and one woman, although the differences are not statistically significant. In the MBA competition, the performance levels of all the gender combinations are higher than that of three women teams along the entire distribution, although the differences

are not always significant. Interestingly, at the top 10 percent, the team composed of two men and one woman shows to be the optimal gender combination.

After establishing the differences in performance, we seek to understand which decisions drive these differences. First, we find that three women teams invest significantly less in R&D, both in the undergraduate and MBA competitions. A possible interpretation of these differences is that three women teams are more conservative in their management vision. Second, teams differ in their decisions related to another crucial aspect for performance, namely, brand management. In both competitions, three women teams show significantly lower profits. We identify an important difference in the pricing strategy that leads to these differences: three women teams are pricing their products higher than any other gender combination. That is, these teams are significantly less aggressive in their pricing strategies, and this has consequences on sales, profits, and ultimately on economic performance. Finally, we observe differences on decisions related to corporate responsibility. We find that in both competitions, three women teams invest significantly more in social initiatives than any other gender composition.

While many of our results can be interpreted as being in line with established results in the literature on individual gender differences, we also find new results, which are idiosyncratic to the team level. First, although we do find that three women teams perform worse than other teams, we do not find any evidence for a monotonic relationship between the number of men in the team and their performance, such that teams with one man and three men are not different. Moreover, we find evidence that the best gender composition of a team is two men and one woman. In particular, for MBA students our distributional analysis shows that for the top 10 percent of the distribution, the two men and one woman combination is highly significant.

In our setting, since teams are not exogenously formed, there are competing explanations for the findings we report. It is important to consider and identify the main driving force, since the policy, social, and scientific conclusions are very different depending on the explanation. In the final section, we discuss at length the potential explanations.

The organization of the rest of the paper is as follows. In section 2, we introduce the *L'Oréal E-Strat* game. Section 3 is devoted to the presentation of the demographics in our data. Section 4 establishes the main result on the effect of the gender composition on performance. Section 5 is devoted to the understanding of where the performance

differences come from. In section 6, we discuss alternative explanations for our findings.

2. The Game: *L'Oréal E-Strat*

2.1. Overview of the Game

The *L'Oréal E-Strat* game is one of the biggest online business simulation games. It was designed by Strat-X for L'Oréal. The game was launched in 2000, and since then, there have been more than 250,000 participants, from more than 2,200 institutions spread all over the world. It is open to all students in their final or penultimate year of undergraduate study, or studying an MBA, registered at a university anywhere in the world. Undergraduate and MBA students participate in separate competitions of the same game. All team members must attend the same university, and must provide the following information: name, official ID, age, gender, university, field of study, and country of origin. Teams that do not comply with these requirements are discarded.

The game is played by teams of three members. Each of the teams plays the role of a general manager of a beauty-industry company, competing in a market composed by four other simulated companies. That is, the participating teams do not compete with one another in the same market. The game was designed to simulate real business decisions. In turn, teams make decisions that are related to R&D, brand management and corporate responsibility initiatives. The rules of the game are clearly stated in the detailed instructions. A proper understanding of the instructions requires a good deal of time and effort.⁴ The game is comprised of six rounds, plus a final round that is in a different format. The main performance variable is the *Stock Price Index (SPI)*, which measures the market value of the company, as a consequence of team's decisions, as well as the decisions taken by the competing (simulated) firms. As such, the SPI is not only determined by current profits alone, but also by broader management decisions that may be exploited in the future, such as investment in R&D.

The initial conditions are identical for all participating teams. Subsequently, after decisions are taken in round one, the SPI is computed and only the best 1,700 participating teams in terms of their SPI are selected to pass to the second round, taking into account country and zone quotas. The winning teams in the final round, one undergraduate team and one MBA, are awarded with a 10,000 euros prize each. Perhaps

⁴ The instructions from the 2008 edition are available upon request.

more importantly, they have the opportunity to meet high profile professionals in L'Oréal, and some of them are offered employment opportunities.

In this paper, for an even-handed comparison across teams, we will use data from the first round only. The starting situation in round one is exactly the same for all teams and therefore, the decisions and associated performances in the first round are fully comparable across teams. This is not the case for other rounds, since teams' performance depends on their game history.

2.2. Management Decisions

We distinguish between three different types of decisions that teams must undertake. These decisions generate what we refer to as *midway* outcome variables that in turn affect the final, and most important, outcome variable, the SPI.

First, teams make decisions regarding the investment in R&D. Teams have an R&D department, where researchers discover two new formulae. These formulae should be interpreted as innovations that, if developed, can be used to create new brands or improve the existing ones. Teams must then make two main decisions. First, teams must decide whether to invest in zero, one or two formulae. Second, if they decide to invest in any formula, they must specify the amount that they wish to spend. These decisions form the midway outcome variable, namely total R&D investment.

Second, teams must manage their brands. All teams start with the same two brands. Brands differ in their characteristics in a way that they are targeting a specific customer profile. Participants know whether the brand is targeting high-earners; affluent families; medium income families; low income singles; or low income families. In each edition, there are different brand targets for each of the two brands. The two main decisions that teams must take are the price and the production level for each of the two brands. These, in turn, influence the main midway outcome variables regarding the brand management, which are composed of sales, revenues, production costs and inventory costs. Finally, these variables determine profits.

Third, teams must decide how much to invest in social and environmental initiatives. The former includes initiatives such as having health programs or continuous learning plans for employees. The environmental initiatives include actions such as using renewable raw materials, reducing water consumption, or having safety and health compliant plants. Teams' investment in these initiatives determine the "Social

Sustainability” and “Environmental Sustainability” indexes, which are the main two midway outcome variables in this area.

Overall, the decisions made in all three of these areas affect the market value of the company, and this is incorporated in the main performance variable, the SPI.

2.3. Data and the Relation between Managerial Decisions and Performance

Our database consists of the last three editions of the *L’Oréal E-Strat*; from the years 2007, 2008 and 2009. This comprises of a total of 37,914 participants from 1,500 different universities, located in about 90 different countries around the world.⁵

Success in the *L’Oréal E-Strat* business game, represented by high values in SPI, is determined by the midway outcome variables and ultimately by teams’ management decisions. In this section, we elaborate on the relationship between decision variables, midway outcome variables and the final performance variable, the SPI. This will facilitate the understanding and interpretation of the team differences in performance. We look at the associations across variables in two ways.

First, we show that there exists a relationship between the midway outcome variables and the SPI. We use a simple regression analysis, where we relate the final performance measure, the SPI, to the midway decision variables, separately for the two competitions, undergraduate and MBA students. The results are shown in the first two columns of Table 1. For both competitions, all the midway outcome variables are positively and significantly related with SPI. We also estimate these regressions for each of the editions separately and we find qualitatively the same results (see Table A.3 in the online appendix). When we run regressions separately for each of the midway outcome variables on SPI, shown in Table A.4 in the online appendix, we see that there are large differences in the importance of each variable. The values for the R-squared show that, not surprisingly, most of the variation in SPI is explained by the variation in profits and to a less extent by the variation in investment on R&D and the expenditure on social and environmental initiatives. Furthermore, when we extend this simple framework and allow for a nonlinear relationship, we see that the fit improves. Columns

⁵ About 55 percent of the registered teams do not participate in the game, such that there is attrition. More importantly, we find that there are no significant differences in attrition across different gender combinations. For the undergraduate competition, the attrition rates are 54, 55, 53 and 55 percents for the all women, one man and two women, two women and one man, and three men teams, respectively. For the MBA competition, the corresponding attrition rates are 59, 57, 56 and 55 percents. In both cases, a chi-square test cannot reject the null hypothesis of independence between the gender composition and attrition rate variables. This suggests that reverse causality is less of a concern in our dataset.

(3) and (4) include polynomials up to the third degree, where we see that the R-squared improves a great deal, explaining up to 80% of the variation in SPI.⁶ This implies that the midway outcome variables are the key variables in determining the SPI.

Second, we examine the ex-post decisions and performance of the top and bottom performing teams. Table 2 reports the mean for each of the decisions, midway outcomes, and the SPI, separately for the top and bottom 10 percent teams. Columns (3) and (6) show the p -values for the one-way ANOVA test of equality of means across the top and bottom performing teams' decisions and outcome variables. We can clearly see that there are sizeable and highly significant differences in the decisions and in the outcome variables of these two groups, both in the undergraduate and MBA competitions.

As for the midway outcome variables, top and bottom performing teams differ in all of them, with the exception of total costs and social sustainability index. The top 10 percent teams invest more in R&D; they have significantly higher sales, revenues and profits; and significantly fewer inventories. Finally, the top 10 percent teams have significantly higher environmental sustainability index.

As for the specific decision variables, again top and bottom performing teams differ significantly. Top performing teams have on average more formulae, and their pricing and production strategies are also systematically different. For high and medium-income brands, the top 10 percent set significantly lower prices, while for singles and low-income brands, the top 10 percent set significantly higher prices. Finally, for all brands, the top performing teams produce significantly more.

3. Demographics

We now look at the main demographic variables, shown in Table 3. In the undergraduate competition there are a total of 12,759 women and 14,525 men, while in the MBA competition there are 3,934 women and 6,697 men. Participation, by gender, in the undergraduate competition is comparable (47% women and 53% men), while in the MBA competition, men are more prevalent (37% and 63%). These proportions are representative of the real-life gender ratios in undergraduate and MBA studies.⁷

⁶ We also try other nonlinear specification, such as using a logarithm model and by including interactions between variables. However, these specifications were dominated by the polynomial model. The results for these specifications can be found in Table A.5 in the online appendix.

⁷ For undergraduates, according to the *World Development Indicators* database (World Bank, 2008), the average worldwide ratio of female to male enrollments in tertiary education is 105.3. For MBA students,

The *L'Oréal E-Strat* game is played by teams of three people. We classify teams into four categories: all women; one man and two women; two men and one woman; all men. We denote the team composition by M_x , where x is the number of men in a team and $(3 - x)$ females. In the undergraduate competition, the distribution of teams by gender composition is 19%, 27%, 30%, and 24% for M0, M1, M2, and M3 teams, respectively, while in the MBA competition is 11%, 23%, 33%, and 33%.

With respect to the demographic variables, undergraduate and MBA students differ on a number of expected dimensions. MBA students are older, study more Business related subjects, and are more likely to study in foreign institutions. At both the undergraduate and MBA levels, the four different types of teams look very similar in terms of their characteristics. We do see that, at the undergraduate level, M0 teams are formed by students with less Science oriented studies. Also, M0 teams are slightly younger than M3 teams both at the MBA and undergraduate levels. Finally, it is interesting to note that there is slightly more field diversity in mixed teams both in the MBA and in the undergrad teams. In the analysis that follows, we will control for all of these characteristics.

4. Does the Gender Composition of Teams Matter for Performance?

4.1. The Overall Effect

We start our analysis by looking at the main performance variable, namely the SPI. In what follows, we will use standardized SPI.⁸ In order to understand whether the gender composition of the team has any effect on performance, we estimate the following equation by OLS, separately for the undergraduate and MBA competitions:

$$Y_i = \alpha + \beta_1 M1_i + \beta_2 M2_i + \beta_3 M3_i + X'\theta + \delta_j + \gamma_t + \varepsilon_{ijt} \quad (1)$$

where the dependent variable Y_i denotes the standardized SPI of team i . The gender composition of the teams is captured by the variables M1 to M3, where M_i takes the value of 1 when the team has i man and $(3-i)$ women and 0 otherwise. The omitted category, to which these variables are compared, refers to M0 teams. X is a vector of

Bertrand et al. (2010) report that the US average of MBA students earned by women in the last two decades is about 40 percent.

⁸ SPI values are standardized to a distribution with zero mean and a unit standard deviation, by subtracting the mean SPI from the SPI and dividing this difference by the standard deviation of the SPI, for each competition in a given year. In the same way, we standardize the dependent variables we study in section 5.

variables that control for the mean age, field of study, field diversity, country diversity, and institution diversity.⁹ In addition, we control for geographical areas (i.e., zones), δ_j , and year fixed effects γ_t . Finally, we cluster the standard errors at the zone and year level.

Table 4 reports the results from estimating equation (1). The first two columns show the effect of gender composition of teams on SPI for the undergraduate and MBA competitions, respectively, without any controls. We find that the three women teams are significantly outperformed by any other gender composition, both at the undergraduate and MBA levels. In the undergraduate competition, we see that the teams with one man, two men and three men significantly outperform three women teams by 0.15, 0.19 and 0.15 of a standard deviation from the mean, respectively. The corresponding values at the MBA level are 0.15, 0.24 and 0.23, respectively.

Columns (3) and (4) include the control variables X , as well as the year and zone fixed effects. The differences persist. We find that teams with one man, two men and three men outperform three women teams by approximately 0.15, 0.21 and 0.18 of a standard deviation from the mean, respectively, in the undergraduate competition. The corresponding values at the MBA level are 0.12, 0.20 and 0.17. These differences are significant at conventional levels, except in the MBA case for the relationship between M1 teams and M0 teams, which is significant only at the 11% level. Furthermore, there are no significant differences among teams of one man, two men and three men, suggesting that there is not a monotonic relationship between the number of men and team performance. Therefore, it is the case that the main difference is between three women teams and all other gender combinations. However, it is worth mentioning that from the magnitudes, we see that there is some suggestive evidence that teams with one woman and two men are the best performing teams; however, we do not find statistical significance for this. When we estimate these regressions for each of the editions separately and we find qualitatively similar results (see Table A.6 in the online appendix).

With respect to the control variables, it is important to control for year fixed effects, since the different editions have some variations. Other variables, such as age at the MBA level are also important in explaining the differences in SPI. Given that the impact of experience on performance may differ for women and men we interact age

⁹ See the notes in Table 3 for the definitions of these variables.

with team's gender composition, shown in Table A.7 in the online appendix.¹⁰ We see that for both MBA and undergraduate students, the coefficients on the gender composition variables remain significant and positive, showing that age is not driving the results on the underperformance of three women teams.

We next check for the robustness of the overall effect. In particular, we study the influence of the quality of the institution attended by the team members. One potential explanation for three women teams being outperformed is that all women teams, when compared with the other team compositions, are attending a university or business school that is of a poorer quality, thus reflecting a low ability level of the team members. We address this point in two ways. First, we use measures of institutional quality that are external to the *L'Oréal E-Strat* Game. Namely, we use the 2009 Ranking Web of World Universities as a measure of the quality of the school for the undergraduate competition and the 2009 Financial Times Ranking of MBAs for the MBA competition.¹¹ These rankings contain around 85% of the universities and 70% of the business schools in our database. Columns (5) and (6) in Table 4 report the results when we include the ranking of the schools. The results are robust to the inclusion of this additional control, and the coefficients and significance levels are very similar. Second, we control for the institutional quality by including institution fixed effects. Since we observe many of the same institutions over the years, by adding the fixed-effect, we can control for the quality of each institution, as well as any other school-specific characteristic. The last two columns in Table 4 report the results. Once more, we find that three women teams are outperformed by teams of any other gender composition. Furthermore, the magnitude and the significant levels remain the same.¹²

We, therefore, conclude that the underperformance of three women teams is present at both, the undergraduate and MBA competitions. Also, interestingly, looking at the point estimates, there is some suggestive evidence that the best performing gender combination is the mixed team with two men and one woman, both at the undergraduate and MBA levels, although it is not statistically significant at conventional levels.

¹⁰ First, we interact the gender composition variables with the deviation of the average age in the team from the average age in the corresponding sample. Second, we interact the gender composition variables with the deviation of the maximum age of the team from the average age in the corresponding sample.

¹¹ <http://www.webometrics.info/top6000.asp> and <http://rankings.ft.com/businessschoolrankings/global-mba-rankings>

¹² We also consider a different way of controlling for the team's field of study. We construct dummy variables that identify every possible combination of different fields of study, e.g. "EBS" is a dummy variable that takes the value of 1 when the team is composed of an Economics student, a Business student and a Science student; and 0 otherwise. The results are both qualitatively and quantitatively the same.

4.2. Distributional Analysis

Our estimation analysis so far has focused on the mean effect of the influence of the gender composition of teams on SPI. However, it is also important to understand how the effect of the team's gender composition on SPI varies at different points of the performance distribution. In order to do so, we estimate quantile regressions using equation (1). The results are shown in Figures 1a and 1b, where we plot the coefficients for the different gender compositions, M1, M2 and M3, relative to the omitted category, M0, for each quantile, for undergraduates and MBA students, respectively. Thus the distance between the coefficients, with respect to the horizontal axis, reflects the distance with respect to M0 teams. Table 5 reports the point estimates for the 10th, 20th, 50th, 80th and 90th quantiles.

We start by analyzing the undergraduate case. Figure 1a and Panel A of Table 5 show that M0 teams are significantly dominated by teams with any other gender combination throughout the entire performance distribution. Interestingly, we see large disparities in the magnitudes of these effects. Most notably, the largest differences come from the bottom of the performance distribution, and they decrease monotonically along the distribution. While for teams whose performance is at the bottom 10 percent of the distribution, the M0 teams are outperformed by 0.40, 0.47 and 0.39 of a standard deviation of the mean by M1, M2, and M3 teams, respectively; for teams whose performance is at the top 10 percent of the distribution, the M0 teams are outperformed by less than 0.09 of a standard deviation.

These results are informative for three reasons. First, we see that the underperformance of three women teams is persistent throughout the entire distribution. Second, there is a great deal of heterogeneity in the disparity. In particular, it is important to stress that the high performing three women teams are much more similar to teams of any other gender combination. Third, the point estimates suggest that the mixed team, composed of two men and one woman, has the highest performance levels all over the distribution. This is inline with our findings in section 4.1, when studying the overall effect. However, these differences are not significant at conventional levels, providing only suggestive evidence.

Figure 1b and Panel B in Table 5 report the results for the MBA students. The coefficients for all the gender combinations, with respect to M0, are positive along the entire distribution, suggesting that three women teams are underperforming.

Interestingly, unlike the undergraduates, the differences are less robust across the distribution and are often insignificant, especially in the bottom half of the distribution. Furthermore, at the top 10 percentile, we see that the only gender composition performing significantly better than M0 teams is the team composed by two men and one woman. This again provides evidence in favor of gender diversity at the top of the performance distribution.

5. Understanding the Differences in Performance: The Decision Analysis

We have shown that all women teams are significantly outperformed by teams with any other gender composition. In this section, we proceed to understand these differences in performance by analyzing the managerial decisions that teams undertake. In particular, we study team decision-making on R&D, brand management, and social and environmental responsibility initiatives. In the analysis that follows, we estimate equation (1) for each of the three decision variables, including all the controls as in columns (3) and (4) of Table 4.

5.1. Investments in R&D

We analyze whether teams with different gender compositions make significantly different decisions regarding the number of formulae to develop and the investment in R&D. The results are shown in Table 6. The first two columns of Table 6 show the estimates for the number of formulae. Both, at the undergraduate and MBA levels, all gender combinations have significantly more formulae than M0 teams. The columns (3) and (4) in Table 6 show the estimates for the standardized R&D investment. Since there are significant differences in the developed number of formulae, we look at the R&D investment controlling for the number of formulae. The results in the table show that all teams invest more in R&D than the three women teams, even after controlling for the number of formulae.

Given these results, we conclude that the underperformance of three women teams is, in part, explained by their behavior related to R&D, such that women teams invest too little in R&D (see Tables 1 and 2). A possible interpretation of these differences is that all women teams are more risk-averse in their management vision. That is, all women teams seem to overweight the cost associated to R&D decisions, with respect to the potential improvement in the ultimate value of the firm. Indeed, R&D decisions can be interpreted as risky decisions. Looking at the variance of performance conditional on

R&D investment, we see that as investment on R&D increases, the variance produced in performance increases significantly, suggesting riskier choice (see Figure 2).¹³

The literature on gender differences at the individual level has consistently documented differences in risk preferences, such that women tend to be more risk-averse than men (see Eckel and Grossman, 2003 and, Croson and Gneezy, 2009). In this sense, all women teams being more risk-averse is in line with the findings at the individual level. Interestingly, we also see that mixed teams are not significantly different from all men teams, such that having one man or three men does not show significant differences in their R&D investment.

5.2. Brand Management

We now analyze the impact of teams' gender composition on the midway outcome variables that are directly determined by brand management. We start with an analysis at the aggregate level, looking at (standardized) variables such as profits, revenues, costs, sales, and inventories. We then break-down the aggregate analysis to study each of the brands separately.

The main outcome variable related to brands is profits. Accordingly, we first analyze whether the level of total profits earned by teams varies across the different gender compositions. In columns (1) and (2) of Table 7, we report the profits at the aggregate level, for undergraduates and MBA students, separately. Both at the undergraduate and MBA levels, we find that every gender composition achieves significantly higher profits than M0 teams. When we separate the profits into revenues and production costs, we see that the difference is largely related to differences in revenues but not in production costs. The M1, M2 and M3 teams attain significantly higher revenues than M0 teams, but there are no significant differences in production costs. Consistent with these results, Table 7 also shows that all teams produce more than the M0 teams but they also sell more; resulting in lower inventory costs. These differences highlight that the underperformance of M0 teams is also related to their brand management. We see that M0 teams are choosing worse selling strategies than the rest of teams.

To understand the differences in their selling strategy, we now turn our attention to the analysis of brand management at the brand-type level. Consumers are divided into

¹³ Looking at the mean investment by team gender composition, the mean investment by M0 teams is in the second bin of Figure 2, while all other teams' investments are in the third bin.

five different segments, which differ in size, price sensitivity, and preferences. Teams are provided with this information in their instruction manuals. The five segments, ordered by their income (highest to lowest) and price sensitivity (lowest to highest), are: (i) high-earners, (ii) affluent families, (iii) medium income families, (iv) singles, and (v) low income families. Accordingly, brands differ in terms of the type of consumers to which they are targeted. In the three editions of the game in our database, there were four different brand-types: (a) high-income (edition 2007), (b) medium-income families (2009), (c) singles (2008 and 2009), and (d) low-income (2007 and 2008).

Columns (2)-(5) in Table 7 report the analysis at the brand-type level. We see that for undergraduates, the differences identified at the aggregate level, in terms of profits, revenues, sales and inventory costs, are concurrent only for brand-types (b) and (c); the intermediate brand types. When we analyze the other brands, the high-income and low-income brand types, there is almost no difference across teams. We next consider the differences in teams' pricing strategies. We see that with brand-types (b) and (c) that M0 teams choose significantly higher prices than all other gender composition teams. This pricing strategy results in significantly lower revenues (and profits) for the M0 teams, and, in turn, this also explains why M0 have significantly higher inventory costs. We can interpret such a pricing strategy by M0 teams as being less aggressive than the rest of the teams. Again, the literature on gender differences at the individual level offers a plausible explanation for these findings. In particular, it has been shown that women and men have different attitudes toward competition. Not only do women seem to dislike competition more than men, but, under competition, the performance of men is improved relative to that of women (see Gneezy et al., 2003, Gneezy and Rustichini, 2004, and Niederle and Vesterlund, 2007).¹⁴ Arguably, setting the price is a form of competition, and hence, the fact that M0 teams are not competitive enough can be related to the above mentioned findings.

The analysis at the MBA level, when disaggregated by brand-types, does not show consistent and clear significant differences. This is likely to be the result of a reduction in the number of observations, and hence the significance levels are lower. However, the magnitudes and signs are comparable to those found at the aggregate level.

¹⁴ When team performance is defined as the sum of two individuals' independent performance, it has been shown that gender differences under competition are reduced (see Dargnies, 2010, and Healy and Pate, 2010).

5.3. Corporate Responsibility

We now study whether the gender composition of the team has any effect on the social and environmental responsibility decisions, as measured by the standardized SSI and ESI indices. Table 8 reports the results. With regard to social initiatives, we find that three women teams invest significantly more in social initiatives than any other gender composition, both at the undergraduate and MBA level. These differences are as large as 0.12 and 0.16 of a standard deviation from the mean in undergraduate and MBA competitions, respectively. All comparisons are significant, except in the M2 case for MBA students where the coefficient goes in the same direction than all others, but it is not significant at conventional levels. In columns (3) and (4), on the other hand, the gender composition of the teams does not appear to influence decisions related to environmental initiatives.

Hence, gender composition seems to matter for the type of decisions taken regarding the social initiatives. In section 2.3 we observed that SSI is positively related to SPI. However, we also observed that the influence on SPI of the social sustainability initiatives is of an order of magnitude lower than profits. This shows that, although M0 teams invest significantly more in SSI, this has little impact on the final and main outcome variable, on SPI. From Table 1, the polynomial regressions show that there is diminishing returns to spending on SSI, which suggests that M0 may be overinvesting in SSI.

The literature on gender differences at the individual level provides mixed evidence on differences with regard to altruism, values, and social preferences (see Croson and Gneezy, 2009). While there are papers reporting that women are significantly more altruistic than men (see Eckel and Grossman, 1998, Bolton and Katok, 1995, and Andreoni and Vesterlund, 2001), and women having more social oriented values than men (see Adams and Funk, 2010), there are also papers showing that the behavior of women in social contexts is highly sensitive to the details of the context (see Ben-Ner et al., 2004, and Houser and Schunk, 2007). Our findings related to corporate responsibility decisions of teams seem to be mixed, in line with the literature. In particular, while in the case of social initiatives all women teams invest significantly more than all other teams, in the case of environmental initiatives there are no significant differences.

6. Discussion

We have shown that three women teams are outperformed by teams of any other gender combination and that there is not a monotonic relationship between the number of men and team performance. Since teams are formed endogenously, there are competing explanations for our findings. It is important to discuss these explanations since the policy, social and scientific conclusions one would draw from our results are clearly very different depending on what drives them.

We distinguish between two broad competing explanations. First, participating women and men may be different in terms of their unobservable characteristics, such as ability, expectations about the reward structure implicit in the game or the way in which they sort into teams. Second, three women teams may have worse team dynamics than teams of any other gender composition, such that, despite women and men being comparable in all the relevant characteristics (observable and unobservable), three women perform worse within a team than mixed teams or all men teams. This could be due to different reasons. For example, different teams may use different aggregation rules of individual preferences, or they may adopt different mechanisms of internal organization.

We start by considering the differences between women and men regarding unobservable characteristics. First, it could be the case that the distributions of ability between those men and those women that decide to participate in the game are different, and this translates into different skills in teams by gender composition. Since we do not directly observe individual ability, we cannot rule out this possibility. However, we can use observable characteristics, such as age, which may reflect experience; field of study; and quality of the university attended, as proxies for individual ability. Note that when controlling for all of these factors, including the university fixed effects (see Table 4 and the discussion in section 4), we continue to find that all women teams are outperformed by any other gender compositions, both at the undergraduate and MBA competitions. Controlling for these variables is somehow suggestive that the differences in ability between women and men are not the main driving force. Of course, arguably, our observable characteristics are not extensive enough to rule out this explanation entirely.

Second, all women teams might have different expectations about the reward structure implicit in the *L'Oreal E-Strat* game than the other teams. Although we do not have control over the participants' expectations about the reward structure, it is

important to note that all participants are provided with the same instructions, such that in principle the information about the rules and reward structure should not be different.

Third, men and women might have different ways of sorting into teams that is reflected in their performance. For example, low ability women may be more likely to sort into all women teams than are low ability men into all men teams. Alternatively, it could be that shy women are less likely to form a team with men. In this case, women in all women teams will tend to be less social. If social skills are correlated with attributes that matter in the game (e.g., more social people are more self-confident and perform better), then the effect of all women teams could be capturing the impact of social skills. Again, as in the previous case, we can evaluate whether individuals differ on observable characteristics, depending on the team they sort into, to imperfectly test for this hypothesis. From Table 9 we see that, overall, women and men in the different teams look remarkably similar. At the MBA level, there are some small differences, e.g. women who sort into teams with more men are slightly older. However, when we control for these differences in the analysis in section 4, our main findings hold. Nevertheless, more work is needed to study gender differences in team formation.

Finally, if men and women are comparable in all the relevant characteristics, then our results can be explained by three women teams having a worse team dynamics than mixed teams or all male teams. Our findings also suggest that mixed teams show the highest performance, such that, in light of this second competing explanation, diversity in terms of gender would be positively related to good team dynamics.

We hope that this paper will promote future empirical research to understand the influence of gender on teams' performance. In particular, understanding the causal effect behind the underperformance of three women teams needs further research designed to identify the influence of different competing explanations. This will be of great relevance when understanding the functioning of organizations.

References:

Adams, R. B. and P. Funk (2009) "Beyond the glass ceiling: Does gender matter?", mimeo.

Adams, R. B. and D. Ferreira (2009) "Women in the Boardroom and their Impact on Governance and Performance," *Journal of Financial Economics*, 94, 291–309.

Andreoni, J. and L. Vesterlund (2001) "Which is the Fair Sex?" *Quarterly Journal of Economics*, 116:293–312.

Bagues, M. F. and B. Esteve-Volart (2010) "Can Gender Parity Break the Glass Ceiling? Evidence from a Repeated Randomized Experiment," *Review of Economic Studies*, Vol. 77(4): 1301-1328.

Ben-Ner, A., F. Kong and L. Putterman (2004) "Share and Share Alike? Intelligence, Socialization, Personality, and Gender-Pairing as Determinants of Giving," *Journal of Economic Psychology*, 25: 581-589.

Bertrand M, C. Goldin, and L. F. Katz (2010) "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors," *American Economic Journal: Applied Economics*, 2(3): 228-255

Bertrand, M. and K. Hallock (2001) "The Gender Gap in Top Corporate Jobs," *Industrial and Labor Relations Review*, 55-1, 3–21.

Bolton, G. E. and E. Katok, (1995) "An experimental test for gender differences in beneficent behavior," *Economics Letters*, 48(3-4): 287–292.

Byrnes, J., D. Miller, and W. Schafer (1999) "Gender Differences in Risk Taking: A Meta-Analysis," *Psychological Bulletin*, 75, 367–383.

Carter, D., Simkins, B., Simpson, W. (2003) "Corporate Governance, Board Diversity, and Firm Value," *Financial Review*, 38, 33–53.

Charness, G. and U. Gneezy (2007) "Strong Evidence for Gender Differences in Investment," mimeo.

Charness, G. and M. Jackson (2007) "Group Play in Games and the Role of Consent in Network Formation," *Journal of Economic Theory*, 136, 417–445.

Charness, G., L. Rigotti and A. Rustichini (2007) "Individual Behavior and Group Membership," *American Economic Review*, 97, 1340–1352.

Croson, R. and N. Buchan (1999) "Gender and Culture: International Experimental Evidence from Trust Games," *American Economic Review P&P*, 89(2), 386–391.

Croson, R. and U. Gneezy (2009) "Gender Differences in Preferences," *Journal of Economic Literature*, 47(2), 1–27.

Dargnies, M.P. (2010) "Team Competition: Eliminating the Gender Gap in Competitiveness," mimeo.

Delfgaauw, J., Dur, R., Sol, J. and W. Verbeke (2009) "Tournament Incentives in The Field: Gender Differences in The Workplace," mimeo.

Dufwenberg, M. and A. Muren (2006) "Gender Composition in Teams," *Journal of Economic Behavior & Organization*, 61(1), 50–54.

- Eckel, C. C., and P. J. Grossman (1998) "Are Women Less Selfish Than Men?: Evidence from Dictator Games." *The Economic Journal*, 108(448): 726–735.
- Eckel, C. and P. J. Grossman. (2003) "Differences in the Economic Decisions of Men and Women: Experimental Evidence." *Handbook of Experimental Results*, edited by Plott and Smith, forthcoming, New York, Elsevier.
- Farrell, K., and P. Hersch (2005) "Additions to corporate boards: the effect of gender," *Journal of Corporate Finance*, 11, 85–106.
- Gneezy, U., M. Niederle, and A. Rustichini (2003), "Performance in Competitive Environments: Gender Differences," *Quarterly Journal of Economics*, 118(3), 1049–1074.
- Gneezy, U., and A. Rustichini (2004) "Gender and Competition at a Young age," *American Economic Review Papers and Proceedings*, 377-381.
- Healy, A. and Pate, J. (2011) "Can Teams Help to Close the Gender Competition Gap?" *The Economic Journal*, forthcoming.
- Houser, D. and Schunk, D. (2009) "Social Environments with Competitive Pressure: Gender effects in the Decisions of German Schoolchildren," *Journal of Economic Psychology*, 30(4): 634-641.
- Manning, A. and Swaffield, J. (2008) "The Gender Gap in Early-Career Wage Growth", *The Economic Journal*, 118 (July), 983–1024.
- Miller, G. (2008) "Women's Suffrage, Political Responsiveness, and Child Survival in American History," *Quarterly Journal of Economics*, 123(3), 1287–1327.
- Niederle, M. and L. Vesterlund (2007) "Do Women Shy Away from Competition? Do Men Compete Too Much?" *Quarterly Journal of Economics*, 122, 1067–1101.
- Sobel, J. (2006), "Information Aggregation and Group Decisions," mimeo.
- Stoner, J. A. F. (1968) "Risky and Cautious Shifts in Group Decisions: The Influence of Widely Held Values," *Journal of Experimental Social Psychology*, 4, 442–459.
- Zinovyeva, N., and M. Bagues (2010) "Does Gender Matter for Academic Promotion? Evidence from a randomized natural experiment", mimeo.

Figures and Tables

Figure 1a: Distributional Analysis for UG

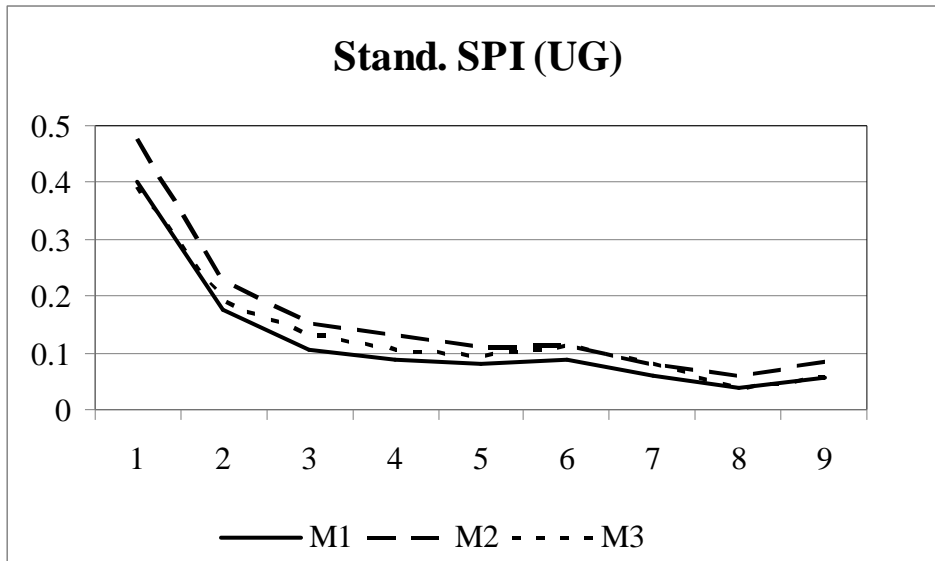
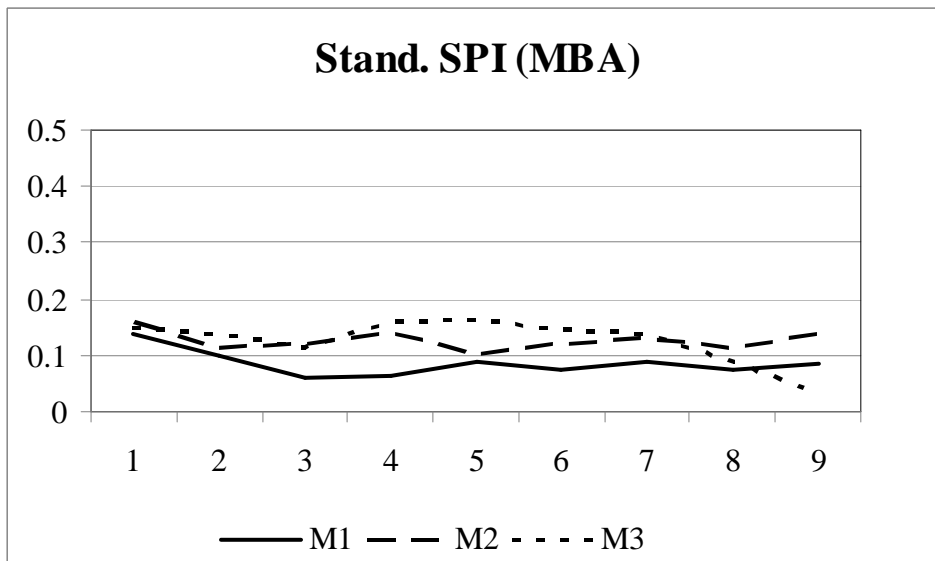
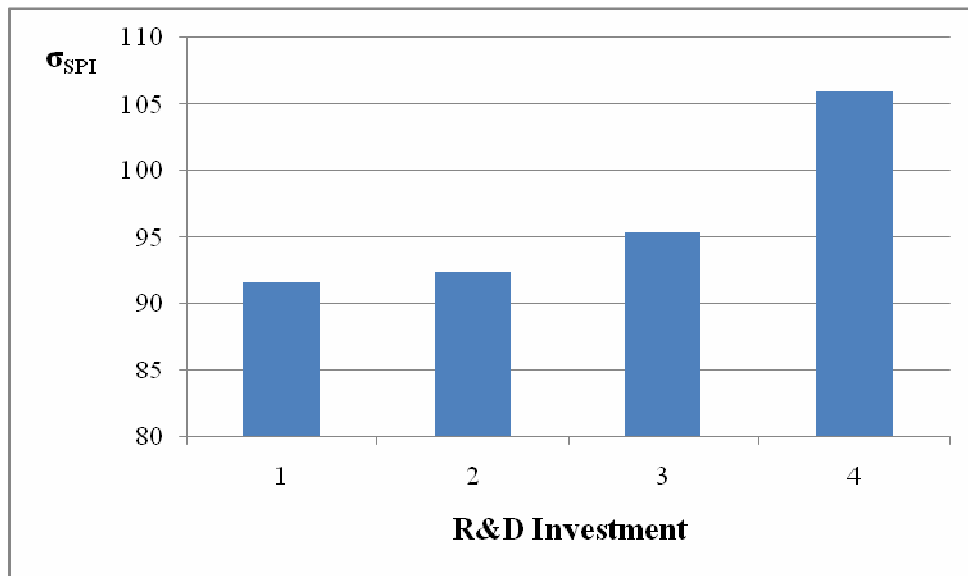


Figure 1b: Distributional Analysis for MBA Students



Notes: 10% to 90% quantile. Table 5 reports the coefficients for the 10%, 20%, 50%, 80% and 90%, and includes the significance levels. All quantiles control for observable characteristics (as listed in Table 4), as well as controls for year and zone fixed effects. The standard errors in all columns are clustered at the year and zone level. The dependent variable, SPI, is standardized to a distribution with zero mean and a unit standard deviation for all quantiles. The team gender categories, M1, M2 and M3, are all compared with the excluded category, M0.

Figure 2: Variation in SPI conditional on R&D Investment



Notes: The first bin of the bar chart corresponds to R&D investment less than 1000000; the second bin corresponds to R&D investment between 1000000 and 2500000; the third bin corresponds to R&D investment between 2500000 and 5000000; and the fourth bin corresponds to R&D investment more than 5000000.

Table 1: Explaining the SPI

	SPI		SPI	
	UG (1)	MBA (2)	UG (3)	MBA (4)
R&D Inv.	0.340*** [0.121]	0.445*** [0.131]	5.870*** [0.340]	6.404*** [0.505]
Profits	0.360*** [0.0221]	0.271*** [0.0717]	0.199*** [0.0377]	0.481*** [0.112]
SSI	0.119** [0.0454]	0.151*** [0.0498]	96.36** [39.43]	23.71 [111.2]
ESI	0.182*** [0.0202]	0.181*** [0.0427]	-12.31 [7.272]	-17.13 [12.87]
R&D Inv. ²			-0.129*** [0.0105]	-0.150*** [0.0143]
Profits ²			0.000189*** [3.32e-05]	-0.0000092 [4.64e-05]
SSI ²			-0.0895** [0.0373]	-0.0216 [0.105]
ESI ²			0.0111 [0.00661]	0.0152 [0.0117]
R&D Inv. ³			0.000766*** [8.17e-05]	0.000979*** [0.000112]
Profits ³			-4.17e-08*** [7.99e-09]	-5.55E-09 [4.65e-09]
SSI ³			2.77e-05** [1.17e-05]	6.56E-06 [3.30e-05]
ESI ³			-3.30E-06 [2.00e-06]	-4.45E-06 [3.54e-06]
Constant	-146.8* [80.91]	21.34 [161.7]	-30.068** [14.447]	-2.408 [39.448]
Year FE	Yes	Yes	Yes	Yes
Obs.	7531	2889	7531	2889
R-squared	0.668	0.523	0.807	0.739

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. R&D investment and Profits are measured in units of 100,000.

Table 2: Comparison of Top and Bottom Performing Teams' Decision and Outcomes

	Undergraduates			MBA Students		
	Top 10%	Bottom 10%	<i>P</i> -Value	Top 10%	Bottom 10%	<i>P</i> -Value
	Mean (1)	Mean (2)	(3)	Mean (4)	Mean (5)	(6)
SPI	1098.55	763.08	0.00	1100.06	792.36	0.00
No_formula	1.56	1.49	0.00	1.56	1.41	0.00
R&D Investment	2843832	2515079	0.00	2891775	2451551	0.01
Price High-Income Brand	28.93	30.51	0.00	28.86	30.15	0.00
Price Medium-Income Brand	16.52	17.74	0.00	16.47	17.84	0.00
Price Singles Brand	12.55	12.08	0.00	12.47	11.98	0.10
Price Low-Income Brand	7.41	6.61	0.00	7.38	6.65	0.00
Production High-Income Brand	6013914	6988092	0.00	6945655	6060997	0.00
Production Medium-Income Brand	8133023	9975688	0.00	1.00E+07	8371768	0.00
Production Singles Brand	9467281	1.01E+07	0.00	1.00E+07	9829152	0.28
Production Low-Income Brand	1.47E+07	1.53E+07	0.00	1.53E+07	1.46E+07	0.00
Sales	2.26E+07	1.95E+07	0.00	2.26E+07	2.00E+07	0.00
Inventories	177317.6	1615838	0.00	160306.1	1307136	0.00
Revenues	2.80E+08	2.26E+08	0.00	2.80E+08	2.34E+08	0.00
Cost	4.75E+07	4.75E+07	1.00	4.75E+07	4.81E+07	0.09
Profits	2.32E+08	1.79E+08	0.00	2.33E+08	1.86E+08	0.00
SSI	1022.13	1021.16	0.48	1017.67	1019.03	0.51
ESI	1072.84	1050.03	0.00	1079.32	1049.38	0.00

Notes: In 2007, one brand is a low-income brand, while the other is a high-income brand. In 2008, one brand is a low-income brand, while the other is a brand directed to singles. In 2009, one brand is a brand directed to singles, while the other is a medium-income brand. For further description see Section 5.2. The *p*-values for the one-way ANOVA test of equality of means across the average decisions and outcomes between the top and bottom 10% teams are shown in columns (3) and (6).

Table 3–Demographics by Gender Composition of Teams

	Undergraduates				MBA Students			
	3 Women	2 Women - 1 Man	1 Woman - 2 Men	3 Men	3 Women	2 Women -1 Man	1 Woman - 2 Men	3 Men
SPI	960.85 (120.96)	977.60 (99.89)	981.20 (99.40)	973.88 (108.23)	963.68 (107.56)	977.19 (104.29)	986.46 (95.24)	984.02 (98.15)
Mean Age	22.348 (1.787)	22.690 (2.178)	22.922 (2.059)	22.992 (2.144)	26.094 (2.905)	26.916 (3.115)	27.651 (3.635)	27.385 (3.753)
Business (Team)	0.650 (0.477)	0.689 (0.463)	0.670 (0.470)	0.614 (0.486)	0.877 (0.328)	0.897 (0.303)	0.901 (0.298)	0.906 (0.291)
Economics (Team)	0.422 (0.494)	0.442 (0.496)	0.407 (0.491)	0.419 (0.493)	0.279 (0.449)	0.270 (0.444)	0.299 (0.458)	0.292 (0.455)
Sciences (Team)	0.138 (0.345)	0.224 (0.417)	0.291 (0.454)	0.285 (0.451)	0.062 (0.242)	0.091 (0.288)	0.096 (0.295)	0.089 (0.285)
Other Fields (Team)	0.046 (0.210)	0.027 (0.164)	0.013 (0.114)	0.015 (0.122)	0.028 (0.167)	0.009 (0.099)	0.009 (0.096)	0.000 (0.029)
Central Europe (Institution)	0.073 (0.260)	0.072 (0.258)	0.091 (0.288)	0.124 (0.329)	0.127 (0.334)	0.139 (0.346)	0.136 (0.343)	0.143 (0.350)
South Europe (Institution)	0.052 (0.223)	0.060 (0.238)	0.077 (0.266)	0.101 (0.302)	0.091 (0.288)	0.087 (0.283)	0.094 (0.292)	0.091 (0.287)
Eastern Europe (Institution)	0.110 (0.313)	0.105 (0.307)	0.103 (0.305)	0.122 (0.328)	0.073 (0.260)	0.058 (0.234)	0.048 (0.215)	0.040 (0.197)
Africa (Institution)	0.063 (0.244)	0.067 (0.251)	0.093 (0.291)	0.121 (0.327)	0.062 (0.242)	0.049 (0.216)	0.065 (0.248)	0.059 (0.235)
South America (Institution)	0.039 (0.194)	0.052 (0.222)	0.062 (0.242)	0.088 (0.283)	0.041 (0.200)	0.051 (0.221)	0.054 (0.227)	0.067 (0.251)
North America (Institution)	0.038 (0.191)	0.037 (0.189)	0.044 (0.205)	0.033 (0.179)	0.258 (0.438)	0.163 (0.369)	0.126 (0.332)	0.101 (0.301)
East Asia (Institution)	0.453 (0.497)	0.447 (0.497)	0.354 (0.478)	0.201 (0.401)	0.187 (0.391)	0.242 (0.428)	0.215 (0.411)	0.068 (0.252)
South Asia (Institution)	0.165 (0.371)	0.154 (0.361)	0.168 (0.374)	0.203 (0.402)	0.154 (0.361)	0.201 (0.401)	0.252 (0.434)	0.425 (0.494)
Area Others (Institution)	0.002 (0.054)	0.003 (0.056)	0.002 (0.054)	0.002 (0.047)	0.002 (0.051)	0.006 (0.078)	0.004 (0.065)	0.003 (0.058)
Field Diversity	0.545 (0.706)	0.735 (0.756)	0.741 (0.781)	0.595 (0.728)	0.454 (0.640)	0.566 (0.700)	0.582 (0.720)	0.490 (0.685)
Country Diversity	0.120 (0.384)	0.144 (0.417)	0.171 (0.449)	0.142 (0.410)	0.507 (0.751)	0.491 (0.745)	0.470 (0.728)	0.376 (0.684)
Institution Diversity	0.284 (0.792)	0.322 (0.824)	0.358 (0.854)	0.341 (0.845)	0.762 (1.130)	0.803 (1.174)	0.775 (1.159)	0.732 (1.158)
Number Teams 2007	623	913	1032	893	167	335	501	444
Number Teams 2008	600	867	923	787	119	277	377	442
Number Teams 2009	484	692	739	543	97	197	289	299
Total Number of Teams	1707	2472	2694	2223	383	809	1167	1185

Notes: Mean Age is the average age of the team members. Fields of study: Business (Team), Economics (Team), Sciences (Team) and Other Fields (Team) are dummy variables representing categories for the fields of study of the individuals in the team. A given category takes a value of 1 if the field of study of any of the three individuals of the team belongs to that category and 0 otherwise. Table A.1 reports the classification of fields of study in the four categories. Geographical areas are dummy variables taking a value of 1 if the country where the institution is located belongs to the respective geographical area, and 0 otherwise. Institutions that are unclassified geographically are collected in Area Others (Institution). Table A.2 reports the assignment of countries to the geographical areas. Field Diversity takes a value of 0, of 1, or of 2 if the maximum number of team members with fields of study belonging to the same category is 3, 2, or 1, respectively. Country Diversity takes a value of 0, of 1, or of 2 if the maximum number of team members with the same country of origin is 3, 2, or 1, respectively. Institution Diversity takes a value of 0, of 1, of 2, or of 3, if the number of team members originally from a country different to the country of the institution is 0, 1, 2, or 3, respectively. Standard errors are reported in brackets.

Table 4: Gender Composition of Teams on SPI

	Stand. SPI		Stand. SPI		Stand. SPI		Stand. SPI	
	UG (1)	MBA (2)	UG (3)	MBA (4)	UG (5)	MBA (6)	UG (7)	MBA (8)
M1	0.153*** [0.0546]	0.152* [0.0780]	0.153** [0.0556]	0.12 [0.0723]	0.138** [0.0530]	0.151* [0.0836]	0.146*** [0.0313]	0.110* [0.0616]
M2	0.192*** [0.0459]	0.243*** [0.0643]	0.207*** [0.0497]	0.197*** [0.0647]	0.211*** [0.0491]	0.199*** [0.0691]	0.196*** [0.0314]	0.168*** [0.0600]
M3	0.146*** [0.0273]	0.231*** [0.0678]	0.176*** [0.0316]	0.173*** [0.0602]	0.162*** [0.0349]	0.163** [0.0707]	0.182*** [0.0331]	0.162*** [0.0615]
Constant	-0.134*** [0.0385]	-0.192*** [0.0562]	-0.26 [0.273]	-0.584*** [0.167]	-0.1 [0.252]	-0.746*** [0.179]	-0.152 [0.211]	-0.425 [0.266]
Controls	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	No	No	Yes	Yes	Yes	Yes	Yes	Yes
School Rank	No	No	No	No	Yes	Yes	Yes	Yes
School FE	No	No	No	No	No	No	Yes	Yes
Cluster	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Observations	9099	3545	8998	3482	7535	2435	8998	3482

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns, except in columns (7) and (8), are clustered at the year and zone level. The dependent variable, SPI, is standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams).

Table 5: Gender Composition of Teams on SPI: Distributional Analysis

Quantiles	Undergraduates					MBA students				
	Stand. SPI 10% (1)	Stand. SPI 20% (2)	Stand. SPI 50% (5)	Stand. SPI 80% (8)	Stand. SPI 90% (9)	Stand. SPI 10% (1)	Stand. SPI 20% (2)	Stand. SPI 50% (5)	Stand. SPI 80% (8)	Stand. SPI 90% (9)
M1	0.400*** [0.0885]	0.175*** [0.0431]	0.0797*** [0.0293]	0.0375* [0.0223]	0.0580*** [0.0213]	0.138 [0.119]	0.065 [0.0613]	0.0889** [0.0420]	0.0727 [0.0481]	0.0441 [0.0711]
M2	0.476*** [0.0887]	0.224*** [0.0429]	0.108*** [0.0291]	0.0614*** [0.0221]	0.0859*** [0.0212]	0.16 [0.115]	0.141** [0.0591]	0.103** [0.0405]	0.113** [0.0465]	0.138** [0.0681]
M3	0.392*** [0.0920]	0.189*** [0.0447]	0.0938*** [0.0306]	0.0383 [0.0233]	0.0555** [0.0219]	0.149 [0.118]	0.159*** [0.0601]	0.164*** [0.0411]	0.0871* [0.0468]	0.0314 [0.0681]
Constant	-2.114*** [0.594]	-0.728*** [0.279]	-0.24 [0.183]	0.420*** [0.135]	0.963*** [0.129]	-2.207*** [0.476]	-0.681*** [0.246]	-0.231 [0.170]	0.528*** [0.191]	0.924*** [0.262]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Obs.	8997	8997	8997	8997	8997	3481	3481	3481	3481	3481

*Notes:** denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. The dependent variable, SPI, is standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams). This table corresponds to Figures 1a and 1b.

Table 6: Gender Composition of Teams on R&D decisions

	Number of Formulae		Stand. R&D Investment	
	UG (1)	MBA students (2)	UG (3)	MBA students (4)
M1	0.0350** [0.0156]	0.0669* [0.0331]	0.0738*** [0.0236]	0.142** [0.0531]
M2	0.0510** [0.0199]	0.0600** [0.0236]	0.118*** [0.0263]	0.196*** [0.0585]
M3	0.0533*** [0.0187]	0.0651** [0.0275]	0.0809** [0.0388]	0.199*** [0.0489]
Number of Formulae			0.902*** [0.0344]	0.863*** [0.0436]
Constant	1.212*** [0.0933]	1.139*** [0.1000]	-1.702*** [0.159]	-1.949*** [0.234]
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
Obs.	7561	2910	7561	2910

*Notes:** denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. The dependent variable, R&D Investment in columns (3) and (4), is standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams).

Table 7: Gender Composition of Teams on Brand Management

		Aggregate		Brand b: High-Income		Brand b: Medium-Income		Brand c: Singles		Brand d: Low-Income	
		UG	MBA	UG	MBA	UG	MBA	UG	MBA	UG	MBA
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Stand. Profits	M1	0.0972** [0.0393]	0.0674 [0.0637]	-0.0105 [0.0608]	-0.011 [0.120]	0.153** [0.0575]	0.144 [0.0823]	0.139*** [0.0458]	0.0502 [0.0458]	0.05 [0.0359]	0.0562 [0.0723]
	M2	0.147*** [0.0469]	0.190** [0.0683]	0.00579 [0.0897]	0.244* [0.117]	0.256*** [0.0559]	0.138 [0.151]	0.184*** [0.0393]	0.0934 [0.0715]	0.0871*** [0.0279]	0.116 [0.0782]
	M3	0.142*** [0.0328]	0.111** [0.0529]	0.107* [0.0469]	0.134 [0.0918]	0.209** [0.0677]	0.152 [0.113]	0.138** [0.0556]	0.0339 [0.0660]	0.0632 [0.0445]	0.081 [0.0569]
Stand. Revenues	M1	0.0944** [0.0384]	0.0665 [0.0632]	-0.0498 [0.0574]	0.00337 [0.0875]	0.0898 [0.0755]	0.0931 [0.0635]	0.0522 [0.0405]	0.0423 [0.0313]	-0.0036 [0.0305]	0.0387 [0.0453]
	M2	0.147*** [0.0486]	0.185** [0.0672]	-0.0283 [0.0859]	0.237* [0.110]	0.185* [0.0868]	0.0751 [0.122]	0.0854* [0.0462]	0.0739 [0.0692]	0.0164 [0.0305]	0.107 [0.0719]
	M3	0.146*** [0.0349]	0.109** [0.0513]	0.0425 [0.0449]	0.109 [0.0706]	0.125 [0.107]	0.123 [0.0868]	0.0716 [0.0549]	0.0215 [0.0316]	0.0245 [0.0385]	0.0573 [0.0391]
Stand. Production Costs	M1	0.0254 [0.0394]	0.026 [0.0745]	0.0111 [0.0554]	-0.0025 [0.131]	0.0285 [0.0962]	0.173 [0.136]	0.0603* [0.0337]	-0.0182 [0.0924]	-0.0162 [0.0303]	0.0248 [0.109]
	M2	0.0622 [0.0520]	0.0565 [0.0663]	0.0384 [0.0686]	0.174 [0.195]	0.132 [0.0873]	0.0883 [0.0744]	0.100* [0.0554]	-0.0986 [0.0956]	-0.0291 [0.0409]	0.0748 [0.117]
	M3	0.0825* [0.0451]	0.0317 [0.0630]	0.136** [0.0587]	0.044 [0.147]	-0.0138 [0.0638]	0.1 [0.112]	0.118* [0.0603]	-0.0744 [0.0967]	-0.00653 [0.0469]	0.0695 [0.0964]
Stand. Sales	M1	0.111*** [0.0348]	0.121* [0.0600]	0.00223 [0.00971]	0.00155 [0.0158]	-0.0247*** [0.00634]	-0.0244** [0.00842]	-0.0268*** [0.00637]	-0.0183** [0.00710]	0.0448 [0.0306]	0.0968 [0.0781]
	M2	0.154*** [0.0411]	0.199*** [0.0655]	0.00356 [0.0112]	-0.0248 [0.0142]	-0.0357*** [0.00586]	-0.0182 [0.0177]	-0.0341*** [0.00594]	-0.0209* [0.0119]	0.0719** [0.0301]	0.158* [0.0812]
	M3	0.159*** [0.0337]	0.135** [0.0532]	-0.0106* [0.00549]	-0.00632 [0.0119]	-0.0286** [0.00998]	-0.0247* [0.0129]	-0.0318*** [0.00916]	-0.0138 [0.0108]	0.0733* [0.0404]	0.120* [0.0627]
Stand. Prices	M1	-- --	-- --	-0.0347 [0.0458]	0.0349 [0.147]	-0.213*** [0.0631]	-0.211*** [0.0517]	-0.116*** [0.0379]	-0.0374 [0.0760]	-0.0187 [0.0377]	-0.0302 [0.0524]
	M2	-- --	-- --	0.0105 [0.0258]	-0.00254 [0.132]	-0.162*** [0.0438]	-0.141 [0.0860]	-0.122*** [0.0420]	-0.0704 [0.0727]	-0.0143 [0.0336]	0.012 [0.0682]
	M3	-- --	-- --	-0.0248 [0.0244]	0.102 [0.105]	-0.189** [0.0590]	-0.183* [0.0823]	-0.141*** [0.0369]	-0.0846 [0.0554]	-0.0374 [0.0403]	-0.00671 [0.0507]
Stand. Production	M1	0.0660* [0.0347]	0.0586 [0.0544]	-0.0213 [0.0868]	-0.0217 [0.0864]	0.112* [0.0566]	0.114* [0.0589]	0.102** [0.0354]	0.139** [0.0529]	0.023 [0.0356]	0.00197 [0.0867]
	M2	0.119*** [0.0389]	0.134** [0.0538]	-0.0236 [0.0826]	0.182 [0.108]	0.208*** [0.0505]	0.0997 [0.0938]	0.165*** [0.0428]	0.124* [0.0669]	0.0495 [0.0391]	0.0804 [0.0736]
	M3	0.107** [0.0417]	0.0956** [0.0450]	0.0448 [0.0403]	0.0705 [0.0757]	0.138 [0.0787]	0.111* [0.0579]	0.141** [0.0511]	0.0773 [0.0612]	0.0459 [0.0512]	0.073 [0.0582]
Stand. Inventory Costs	M1	-0.101** [0.0439]	-0.127 [0.0842]	-0.0017 [0.0758]	-0.00997 [0.164]	-0.216*** [0.0573]	-0.227 [0.163]	-0.149*** [0.0450]	0.0196 [0.0869]	-0.037 [0.0450]	-0.148 [0.0928]
	M2	-0.102** [0.0392]	-0.127 [0.0787]	0.0145 [0.0549]	-0.129 [0.127]	-0.224*** [0.0357]	-0.141 [0.158]	-0.150*** [0.0353]	-0.0182 [0.0770]	-0.0399 [0.0401]	-0.127 [0.0926]
	M3	-0.121*** [0.0414]	-0.091 [0.0679]	-0.0858* [0.0455]	0.00943 [0.105]	-0.233*** [0.0434]	-0.238 [0.141]	-0.133** [0.0599]	-0.0346 [0.0658]	-0.0473 [0.0511]	-0.0692 [0.0835]
Obs.	8997	3481	3367	1386	2458	882	5630	2095	6539	2599	

*Notes:** denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. All columns control for observable characteristics as in columns (3) and (4) in Table 4, as well as controls for year and zone fixed effects. The standard errors in all columns are clustered at the year and zone level. The dependent variables in all columns are standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams).

Table 8: Gender Composition of Teams on Corporate Responsibility

	Stand. SSI		Stand. ESI	
	UG (1)	MBA (2)	UG (3)	MBA (4)
M1	-0.0708** [0.0329]	-0.0900* [0.0450]	0.0202 [0.0259]	-0.0181 [0.0953]
M2	-0.126*** [0.0345]	-0.0701 [0.0533]	0.0261 [0.0315]	0.0135 [0.0680]
M3	-0.0888** [0.0381]	-0.160*** [0.0487]	-0.0216 [0.0335]	-0.0306 [0.0736]
Constant	0.33 [0.204]	0.696*** [0.218]	-0.0649 [0.211]	-0.207 [0.271]
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Zone FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
Obs.	8855	3405	8855	3405

*Notes:** denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. The dependent variables in all columns are standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams).

Table 9–Demographics by Individuals conditioning on the Gender Composition of Teams

Panel A: Undergraduates

	Women in Teams Composed by:			Men in Teams Composed by:		
	3 Women	2 Women-1 Man	1 Woman-2 Men	3 Men	2 Men-1 Woman	1 Man-2 Women
Mean Age	21.968 (1.846)	22.181 (2.256)	22.264 (2.100)	22.578 (2.318)	22.672 (2.313)	22.591 (2.377)
Business	0.528 (0.499)	0.534 (0.499)	0.526 (0.499)	0.469 (0.499)	0.496 (0.500)	0.485 (0.500)
Economics	0.299 (0.458)	0.268 (0.443)	0.249 (0.432)	0.285 (0.452)	0.259 (0.438)	0.291 (0.455)
Sciences	0.093 (0.291)	0.117 (0.322)	0.152 (0.359)	0.207 (0.405)	0.202 (0.401)	0.171 (0.377)
Other Fields	0.080 (0.271)	0.080 (0.272)	0.074 (0.261)	0.038 (0.192)	0.043 (0.204)	0.052 (0.223)
Central Europe	0.073 (0.261)	0.072 (0.259)	0.092 (0.289)	0.124 (0.330)	0.092 (0.289)	0.072 (0.258)
South Europe	0.053 (0.223)	0.060 (0.238)	0.077 (0.267)	0.102 (0.302)	0.077 (0.266)	0.061 (0.240)
East Europe	0.111 (0.314)	0.105 (0.307)	0.104 (0.305)	0.122 (0.328)	0.104 (0.305)	0.105 (0.307)
Africa	0.065 (0.246)	0.068 (0.251)	0.094 (0.291)	0.122 (0.327)	0.094 (0.291)	0.068 (0.251)
South America	0.039 (0.194)	0.052 (0.222)	0.063 (0.243)	0.088 (0.283)	0.063 (0.242)	0.052 (0.223)
North America	0.038 (0.191)	0.038 (0.190)	0.044 (0.205)	0.033 (0.180)	0.044 (0.205)	0.038 (0.190)
East Asia	0.453 (0.498)	0.447 (0.497)	0.355 (0.479)	0.202 (0.402)	0.355 (0.479)	0.447 (0.497)
South Asia	0.165 (0.372)	0.154 (0.361)	0.169 (0.374)	0.204 (0.403)	0.169 (0.375)	0.154 (0.361)
Area Others	0.003 (0.054)	0.003 (0.057)	0.003 (0.054)	0.002 (0.047)	0.003 (0.054)	0.003 (0.057)
Foreign at Institution	0.093 (0.291)	0.107 (0.309)	0.120 (0.325)	0.111 (0.315)	0.116 (0.320)	0.104 (0.305)
Number Individuals Ed. 2007	1869	1826	1032	2678	2064	913
Number Individuals Ed. 2008	1800	1734	923	2360	1846	866
Number Individuals Ed. 2009	1453	1384	738	1629	1478	691
Total Number Individuals	5122	4944	2693	6667	5388	2470

Panel B: MBA Students

	Women in Teams Composed by:			Men in Teams Composed by:		
	3 Women	2 Women-1 Man	1 Woman-2 Men	3 Men	2 Men-1 Woman	1 Man-2 Women
Mean Age	25.634 (3.226)	26.261 (3.537)	26.606 (3.813)	26.957 (4.152)	27.416 (4.181)	26.964 (3.833)
Business	0.767 (0.423)	0.784 (0.411)	0.788 (0.409)	0.782 (0.413)	0.764 (0.425)	0.755 (0.430)
Economics	0.162 (0.369)	0.139 (0.346)	0.129 (0.335)	0.155 (0.362)	0.163 (0.370)	0.163 (0.370)
Sciences	0.031 (0.174)	0.042 (0.201)	0.042 (0.201)	0.050 (0.217)	0.051 (0.221)	0.054 (0.227)
Other Fields	0.040 (0.196)	0.035 (0.183)	0.041 (0.199)	0.013 (0.114)	0.021 (0.145)	0.027 (0.163)
Central Europe	0.127 (0.333)	0.140 (0.347)	0.135 (0.341)	0.144 (0.351)	0.136 (0.343)	0.140 (0.347)
South Europe	0.091 (0.288)	0.088 (0.283)	0.094 (0.292)	0.091 (0.288)	0.094 (0.292)	0.088 (0.283)
Eastern Europe	0.074 (0.262)	0.059 (0.235)	0.049 (0.216)	0.041 (0.197)	0.049 (0.216)	0.058 (0.234)
Africa	0.063 (0.242)	0.051 (0.219)	0.066 (0.248)	0.060 (0.237)	0.067 (0.250)	0.049 (0.217)
South America	0.042 (0.200)	0.051 (0.219)	0.055 (0.228)	0.068 (0.252)	0.054 (0.225)	0.052 (0.222)
North America	0.258 (0.438)	0.164 (0.371)	0.129 (0.335)	0.100 (0.300)	0.128 (0.334)	0.164 (0.371)
East Asia	0.190 (0.392)	0.241 (0.428)	0.215 (0.411)	0.068 (0.252)	0.216 (0.412)	0.242 (0.429)
South Asia	0.152 (0.359)	0.201 (0.401)	0.254 (0.435)	0.425 (0.494)	0.252 (0.434)	0.201 (0.401)
Area Others	0.003 (0.051)	0.006 (0.078)	0.004 (0.065)	0.003 (0.058)	0.004 (0.065)	0.005 (0.070)
Foreign at Institution	0.246 (0.431)	0.269 (0.444)	0.251 (0.434)	0.242 (0.428)	0.255 (0.436)	0.257 (0.437)
Number Individuals Ed. 2007	501	670	501	1332	1002	335
Number Individuals Ed. 2008	357	554	377	1325	754	277
Number Individuals Ed. 2009	291	394	289	897	578	197
Total Number Individuals	1149	1618	1167	3554	2334	809

Notes: Business, Economics, Sciences and Other Fields are dummy variables representing categories for the fields of study of the individual. Each category takes a value of 1 if the field of study of the individual belongs to that category, and 0 otherwise. Table A.1 reports the classification of fields of study in the four categories. Geographical areas are dummy variables taking a value of 1 if the country of origin of the individual belongs to the respective geographical area, and 0 otherwise. Individuals not reporting a geographical area are collected in Area Others. Table A.2 reports the assignment of countries to the respective geographical areas. Foreign at Institution is a dummy variable giving a value of 1 when the country of origin of the individual does not coincide with the country where the educational institution is located, and a value of 0 otherwise. Standard errors are reported in brackets.

Online Appendix for “The Impact of Gender Composition on Team Performance and Decision-Making: Evidence from the Field”

Table A.1—Classification of Fields of Study in Categories

Business			Economics			Science			Other Fields		
Field	Under	MBA	Field	Under	MBA	Field	Under	MBA	Field	Under	MBA
Management	7981	5927	Economics	4314	491	Sciences	2029	144	Communication	496	128
Marketing	2755	1875	Finance	3228	1135	Computer science	1167	184	Language	472	30
Accounting	2052	143				Physics/Chemistry	722	67	Law	422	70
Logistics	545	117				Psychosociology	126	16	Liberal Arts	217	36
Human resources	282	101				Beauty	113	29			
Sales	120	76				Medicine	108	27			
Secretary	27	4				Pharmacy	90	25			
						Veterinary	18	6			
Total:	13762	8243	Total:	7542	1626	Total:	4373	498	Total:	1607	264

Table A.2—Geographical Areas

“Central Europe” (826; 491): Germany, Belgium, France, Ireland, Luxembourg, Monaco, Holland, United Kingdom.

“South Europe” (674; 324): Spain, Italy, Portugal, San Marino, Austria, Switzerland.

“Eastern Europe” (1003; 180): Albania, Bulgaria, Czech Republic, Denmark, Finland, Georgia, Greece, Hungary, Latvia, Lithuania, Norway, Poland, Romania, Russian Federation, Serbia and Montenegro, Slovakia, Slovenia, Sweden, Ukraine.

“Africa” (799; 211): Algeria, Armenia, Cameroon, Egypt, Iran (Islamic Republic of), Israel, Jordan, Kenya, Lebanon, Turkey, Mauritius, Morocco, Sudan, Tunisia, United Arab Emirates, Zambia.

“South America” (561; 202): Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Ecuador, Guatemala, Jamaica, Mexico, Paraguay, Peru, Puerto Rico, Uruguay, Venezuela.

“North America” (350; 499): Canada, United States, Australia, New Zealand.

“East Asia” (3284; 601): China, South Korea, Hong Kong, Japan, Taiwan.

“South Asia” (1573; 1021): Afghanistan, Azerbaijan, Bangladesh, Bhutan, India, Indonesia, Kazakhstan, Malaysia, Mongolia, Pakistan, the Philippines, Singapore, Thailand, Uzbekistan, Vietnam.

Notes: The categories correspond to the classification of countries used in the game. The labels of the categories are determined by the countries in the respective category with the highest number of teams in the game. The number of undergraduate and MBA teams per geographical area are reported in brackets.

Table A.3: Explaining the SPI (by Year)

	All Years SPI		2007 SPI		2008 SPI		2009 SPI	
	UG	MBA	UG	MBA	UG	MBA	UG	MBA
R&D Inv.	0.340*** [0.121]	0.445*** [0.131]	0.573*** [0.0690]	0.602*** [0.0944]	0.710*** [0.0957]	0.950*** [0.197]	-0.00802 [0.0292]	0.0328 [0.0905]
Profits	0.360*** [0.0221]	0.271*** [0.0717]	0.347*** [0.00497]	0.387*** [0.00819]	0.315*** [0.00628]	0.211*** [0.00928]	0.444*** [0.00306]	0.353*** [0.00898]
SSI	0.119** [0.0454]	0.151*** [0.0498]	0.278*** [0.0329]	0.283*** [0.0471]	-0.0616 [0.0583]	0.0549 [0.121]	0.0898*** [0.0215]	0.0978 [0.0625]
ESI	0.182*** [0.0202]	0.181*** [0.0427]	0.238*** [0.0237]	0.201*** [0.0330]	0.170*** [0.0303]	0.134** [0.0550]	0.126*** [0.0134]	0.189*** [0.0338]
Constant	-146.8* [80.91]	21.34 [161.7]	-343.8*** [45.99]	-401.2*** [65.61]	242.8*** [68.34]	353.2** [140.4]	-257.2*** [29.36]	-115.4 [82.83]
Observations	7531	2889	2915	1215	2553	967	2063	707
R-Squared	0.668	0.523	0.636	0.658	0.512	0.368	0.912	0.697

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. R&D investment and Profits are measured in units of 100000.

Table A.4: Explaining the SPI

	SPI		SPI		SPI		SPI	
	UG	MBA	UG	MBA	UG	MBA	UG	MBA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
R&D Inv.	0.470** [0.173]	0.467** [0.183]						
Profits			0.360*** [0.0202]	0.276*** [0.0672]				
SSI					0.0121 [0.0570]	0.0623 [0.0757]		
ESI							0.229*** [0.0401]	0.240*** [0.0470]
2008	-21.67*** [5.251]	-21.20*** [7.414]	114.0*** [8.854]	85.61*** [26.97]	-25.02*** [6.245]	-20.35*** [6.555]	-23.62*** [6.197]	-20.91*** [6.716]
2009	38.22*** [5.122]	44.93*** [6.960]	-2.398 [3.137]	11.94 [11.03]	47.12*** [4.115]	55.11*** [5.583]	44.84*** [4.310]	51.39*** [5.379]
Constant	972.2*** [4.059]	976.6*** [5.370]	161.2*** [45.39]	349.2** [152.0]	958.3*** [57.71]	911.3*** [77.86]	729.3*** [42.25]	721.6*** [49.56]
Obs.	7650	2956	9098	3544	8956	3468	8956	3468
R-squared	0.078	0.094	0.621	0.488	0.07	0.084	0.081	0.098

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. R&D investment and Profits are measured in units of 100000.

Table A.5: Explaining the SPI: Other Specifications

	SPI			SPI	
	UG	MBA		UG	MBA
	(1)	(2)		(3)	(4)
Ln(R&D Inv.)	18.20*** [2.203]	20.26*** [2.006]	R&D Inv.	7.026*** [1.936]	4.11E+00 [6.591]
Ln(Profits)	663.8*** [64.26]	704.2*** [78.27]	Profits	-0.691*** [0.240]	-3.30E-01 [1.072]
Ln(SS1)	110.7* [55.14]	163.7*** [49.00]	SSI	-1.321* [0.679]	-0.955 [1.621]
Ln(ESI)	170.0*** [21.70]	163.2*** [31.03]	ESI	-1.072** [0.484]	0.759 [0.676]
			R&D Inv.*Profits	-0.00250* [0.00122]	-2.74E-03 [0.00508]
			R&D Inv.*SSI	-0.00389*** [0.00104]	-8.06E-04 [0.00173]
			R&D Inv.*ESI	0.000539** [0.000223]	6.96E-04 [0.000816]
			Profits*SSI	0.000479*** [0.000116]	-9.99E-05 [0.000227]
			Profits*ESI	0.00033 [0.000509]	-0.000337 [0.000714]
			SSI*ESI	2.277*** [614.2]	894.3 [2.060]
Constant	-6.139*** [812.8]	-6.776*** [845.2]	Constant	-30.068** [14.447]	-2.408 [39.448]
Year FE	Yes	Yes	Year FE	Yes	Yes
Obs.	7531	2889	Obs.	7531	2889
R-squared	0.668	0.669	R-squared	0.674	0.527

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. R&D investment and Profits are measured in units of 100000.

Table A.6: Gender Composition of Teams on SPI (by Year)

	All Years		2007		2008		2009	
	Stand. SPI		Stand. SPI		Stand. SPI		Stand. SPI	
	UG	MBA	UG	MBA	UG	MBA	UG	MBA
M1	0.153** [0.0556]	0.121 [0.0723]	0.0277 [0.0526]	0.0815 [0.0956]	0.281*** [0.0528]	0.0746 [0.110]	0.158*** [0.0593]	0.225* [0.124]
M2	0.207*** [0.0497]	0.197*** [0.0647]	0.0933* [0.0520]	0.188** [0.0926]	0.273*** [0.0527]	0.214** [0.107]	0.273*** [0.0591]	0.200* [0.119]
M3	0.176*** [0.0316]	0.173*** [0.0602]	0.154*** [0.0538]	0.192** [0.0945]	0.150*** [0.0550]	0.176* [0.107]	0.224*** [0.0636]	0.219* [0.122]
Constant	-0.263 [0.273]	-0.584*** [0.167]	0.570** [0.241]	-0.600** [0.278]	-0.354 [0.329]	-0.737* [0.421]	-0.856*** [0.281]	-0.740* [0.379]
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes						
Zone FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Observations	8998	3482	3367	1386	3172	1213	2459	883

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. The standard errors in all columns are clustered at the year and zone level. The dependent variable, SPI, is standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams).

Table A.7. Interaction with Age

	Average Age of Team-Average Age		Maximum Age of Team-Average Age	
	Stand. SPI	Stand. SPI	Stand. SPI	Stand. SPI
M1	0.147*** [0.0318]	0.115* [0.0629]	0.159*** [0.0323]	0.129* [0.0662]
M2	0.204*** [0.0316]	0.195*** [0.0609]	0.221*** [0.0326]	0.228*** [0.0640]
M3	0.166*** [0.0332]	0.165*** [0.0615]	0.174*** [0.0343]	0.190*** [0.0644]
M1*(Av_Age_Team-Av_Age)	-0.0276* [0.0163]	-0.0281 [0.0209]		
M2*(Av_Age_Team-Av_Age)	-0.0356** [0.0164]	-0.0299 [0.0196]		
M3*(Av_Age_Team-Av_Age)	-0.0117 [0.0167]	-0.024 [0.0195]		
M1*(Max_Age_Team-Av_Age)			-0.015 [0.0141]	-0.0216 [0.0184]
M2*(Max_Age_Team-Av_Age)			-0.022 [0.0140]	-0.0310* [0.0173]
M3*(Max_Age_Team-Av_Age)			-0.00742 [0.0144]	-0.0249 [0.0172]
(Av_Age_Team-Av_Age)	0.0215 [0.0139]	0.0469*** [0.0182]		
(Max_Age_Team-Av_Age)			0.0123 [0.0119]	0.0465*** [0.0158]
Constant	-0.266* [0.138]	-0.0148 [0.210]	-0.276** [0.138]	-0.0627 [0.211]
Controls	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Zones FE	Yes	Yes	Yes	Yes
Cluster	Yes	Yes	Yes	Yes
Observations	8998	3482	8998	3482

Notes: * denotes significance at the 10% level, ** denotes significance at the 5% and *** denotes significance at the 1% level. All columns control for observable characteristics as in columns (3) and (4) in Table 4, as well as controls for year and zone fixed effects. The standard errors in all columns are clustered at the year and zone level. The SPI in all columns is standardized to a distribution with zero mean and a unit standard deviation. The excluded team gender category is M0 (i.e., all women teams). For undergraduates the average age is 22.64 and for MBA students this is 26.95.