Student Performance: Does Effort Matter?

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Previous studies find mixed results on whether effort has a positive impact on student performance. Using observed rather than self-reported measures of effort, I find that students' efforts do have a significant positive impact on their performance. I find that students do better on exams if they attempt the homework and if they make an effort to attend class, to arrive on time, and to participate in class discussions.

Whenever a student comes to my office seeking advice on how to do better in my senior-level corporate finance class, the discussion invariably focuses on the student's effort. We discuss study habits, the number of problems worked outside of class, methods of working the problems (with or without the aid of notes and examples), attendance, and participation in class discussions. Based on casual observation, I have concluded that these factors are important to a student's success or failure in my class.

In this study, I test the validity of my advice by examining the link between effort and performance in the senior corporate finance class I teach at Baylor University. Holding constant measures of ability and other student characteristics, I examine the impact of effort on student performance by using measures of whether the students are attempting the homework problems, whether they are attending class and arriving on time, and the extent to which they contribute to class discussions. To control for differences in abilities between students, I also examine the impact of SAT scores on their performance. And, since several previous studies find that gender affects performance in introductory finance classes, I include a dummy variable for gender.

My study differs from earlier studies in several ways. First, although most studies of effort rely on self-reported information, I use directly observed measures of effort. In addition, instead of measuring the time spent studying, I measure whether the students have attempted the homework problems. As a result, I believe my measure of effort captures whether students are putting in effort to learn, rather than if students perceive themselves as making an effort to learn or spending a lot of time studying. Also, where some previous studies examine the impact of attendance on student performance, I examine differences between the impact of absences that are excused and those that are not. Separating excused from unexcused absences allows me to differentiate between variables over which students have control, such as making the effort to come to class, and over those they do not, such as being sick or away on a university-related activity. Finally, I examine a different population of students. Rather than focus on students in introductory finance classes, which are taken by students with a variety of majors, I examine students in a senior-level corporate finance class taken almost exclusively by students who are finance majors.

In general, I find that both ability and effort have a positive impact on student performance. However, once I account for ability and effort, I find that gender has no explanatory power.

The paper is organized as follows. Section I reviews the results of previous studies of the determinants of student performance. Section II discusses the sample and data, and Section III discusses the results. The final section contains a summary and conclusions.

I. Previous Studies on Student Performance

Although Pascarella and Terenzini (1991) and Carroll (1963) find that most educators believe that effort is positively related to performance, previous empirical studies of the link between effort and student performance find mixed, and often contradictory, evidence on whether additional effort improves or harms performance.[1] Both Didia and Hsnat (1998) and Nofsinger and Petry (1999) measure effort in introductory finance classes by using the self-reported number of hours each student spent studying for the class. Didia and Hsnat find a negative relationship between effort and performance, and Nofsinger and Petry find no significant relationship. However, when they measure effort by the number of attempts and amount of time spent on repeatable computerized exams, Johnson, Joyce, and Sen (2002) find that in introductory finance classes, effort has a positive impact on student performance.

Studies that examine the impact of different types of effort on performance might help to explain the unclear relationship between performance and the total amount of time a student devotes to a class. Although Nofsinger and Petry find no relationship between performance and total time studied, they find a positive relationship between performance and studying in a group, taking more time on exams, and spending a greater percentage of total study time on studying notes. In a study of economics students, Schmidt (1983) finds that time spent in lecture, discussion sections, and studying for the second exam have positive impacts on performance on the final while time spent studying for the final may have a negative impact for weak students. In another study of economics students, Dean, Stevens, and Stevens (2006) find that the higher the percentage of total study time devoted to cramming, the lower the performance on exams; but they also find that students can overcome the negative impact of cramming by increasing total hours studied.

The only other study of finance student performance that examines variables related to behavior in the finance class is that of Chan, Shum, and Wright (1997). Using a Tobit model, these authors find that student performance in introductory finance classes is positively related to

[1] In this review of previous studies, I focus on papers that examine the determinants of performance of students in

attendance. However, when they use Heckman's (DATE) two-stage model to correct for survivor bias, they find that performance is not significantly related to attendance.

Several studies find that student attributes, as compared to student effort, impact student performance. Using ACT composite scores, Johnson, Joyce, and Sen find a significant positive relationship between scores on college entrance exams and student performance in introductory finance classes. Schuman (1985) finds a similar positive relationship between GPA and SAT scores. Filbeck and Smith (1996) find that personality differences, as measured by Myers-Briggs, affect student performance.

Previous studies that examine the impact of student attributes on performance find contradictory results on the impact of gender on performance. Terry (2002), Borde, Byrd, and Modani (1998), and Sen, Joyce, and Toutant (1997) find that even when other factors are considered, males significantly outperform females in introductory finance classes. But Johnson, Joyce, and Sen find that once they take effort into consideration, gender has no significant impact on performance. Filbeck and Smith also find that once differences in personality types are accounted for, gender has no significant impact on performance.

Several studies find that variables other than student effort and attributes affect performance. Terry and many others find that a student's overall GPA and the grades the student has earned in courses related to finance (like accounting) have a significant, positive relationship to student performance in introductory finance classes.[2] Terry also finds that students in summer school do better. Chan and Shum (2004) find that students do not perform as well on a comprehensive final if they are allowed to earn partial credit for correcting mistakes on exams. Using survey

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finance classes. However, where there are no similar studies in the finance education literature, I include some studies from the broader body of literature that examine the determinants of student performance.

methods, Paulsen and Gentry (1995) find that aptitude, motivation, and learning strategies impact student performance in introductory finance classes.

Studies that examine the impact of variables other than student effort and attributes on student performance also find many contradictory results. Terry and Sen, Joyce, and Toutant both find evidence showing that finance majors do better, and that marketing majors do significantly worse, in introductory finance classes. However, Sen, Joyce, and Toutant find mixed results indicating that non-business majors do significantly better in introductory finance classes. Borde, Byrd, and Motani find that employment while attending school has a significant negative effect on student performance, but Chan, Shum, and Wright find no significant impact. Borde, Byrd, and Motani find that students who transfer from community colleges have significantly lower grades, but Terry finds that performance by transfer students is not significantly different from other students.

II. Sample and Data

I collect data on students who completed the senior-level corporate finance classes (Finance 4360), which I taught from spring 2002 through summer 2003. This course is required for all finance majors at Baylor University and is usually taken right after the introductory finance class required of all business majors. Since I have been the only instructor for Finance 4360 for several years, I am able to include in the final sample of 230 students all finance majors at our school who took Finance 4360 during the sample period.

Section (class) size over the sample period ranged from 15 to 32 students, with an average class size of 26.7 and a median class size of 28. During the sample period, there were two sections of the course offered each fall, three sections each spring, and one section each summer.

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[2] Johnson, Joyce, and Sen; Nofsinger and Petry; Borde, Byrd, and Modani; Chan, Shum, and Wright; Sen, Joyce,

A. Student Performance

In my courses, I determine course grades through exams, attendance and participation in class, attempting homework, and a group project. I determine grades by adding up points, rather than averaging them. Because of differences in the number of exams given in each term and in the number of possible points on each exam, the total possible number of exam points varies from semester to semester. As a result, the dependent variable in this study, Exam Percent equals the sum of each student's exam scores for the semester as a percentage of all possible exam points for the semester.

B. Measuring Effort

I base all variables used to measure effort on records that I kept on each student in every semester. I used all of these variables to determine each student's grade for the course. These measures of effort, which affected course grades, were available to all students to verify at any time during the semester. Because students were able to verify their grades, their verification ensured the accuracy of my measures.

1. Homework

Rather than earning homework points by turning in problems to be graded, students in my classes earn homework points by coming to the blackboard to write their solutions to the homework problems. They then explain their answers to the class. To a lesser extent, students can also earn homework points by asking insightful questions about the homework problems. On the days I set aside to discuss the homework, I first give the class the answers to the assigned problems, then ask the class which problems they want to discuss. Then, for about half of the time set aside for homework, I randomly call on students to discuss their solutions. For the remaining half of the class, I allow students to volunteer to show and discuss their solutions.

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and Toutant; and Filbeck and Smith find similar results.

When students discuss their homework solutions, they receive full credit towards their homework grade as long as they have attempted a problem. There is no penalty for getting an incorrect answer. As a result, homework points earned in my class primarily reflect effort, rather than understanding. Students who are called on at random may ask to be excused from showing their solution to a problem if they have not worked on the problem before class. Asking to be excused results in the student being marked as unprepared to discuss the homework and has a negative impact on their homework grade.

In rare cases a student does not ask to be excused, but it becomes clear to me that he or she has not worked on a problem before coming to the blackboard. In this case, I count the student as unprepared.

The homework variables I use in this study measure the number of homework days on which a student was prepared or unprepared.[3] Thus, the variable Homework Days Prepared represents the number of days on which each student gave evidence of having worked on the homework by either asking or answering questions about the homework. Homework Days Unprepared or Absent equals the number of days on which a student either elected not to answer or was absent when called on to discuss their answers.

I note that the homework days variables do not perfectly measure whether or not students have attempted the homework. Students may have done so but not been called on, or asked a question, or volunteered to discuss their solutions. Other students may not have attempted the homework but not been called on. Or students may have been absent for reasons unrelated to whether or not they are prepared to discuss the homework.

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3 I find similar results when I use the number of times a student was prepared or unprepared rather than the number of days a student was prepared or unprepared. These results are available on request.

In my classes, as required homework I assign the problems on exams from previous semesters, usually problems from only the most recent semester's exams. However, in Spring 2003, I began to assign the two most recent semester's exams as required homework. I doubled the required homework because over the years, many students had told me they had begun to do better in my class after they started working more old exams than I had assigned as required homework. Therefore, Homework Doubled is a dummy variable that equals zero for students taking my class when I assigned exams from only one semester (the most recent semester) as required homework, and one for those taking my class when I assigned exams from two semesters (the two most recent semesters) as required homework.

2. Absences and Late

The Total Absences variable is the number of days a student missed class during a semester. Excused Absences is the number of days a student was absent but excused according to university policy for medical reasons or for university-sanctioned activities. I also occasionally excused students for trips related to job interviews. Unexcused Absences is the number of days a student was absent without being excused. Late is the number of days a student was late to class during the semester.

3. Participation

The variable Participation measures each student's participation in class discussions. On most days I assigned participation points to students who made comments, asked questions, or answered questions during class. The number of points assigned to those who made comments depended on my perception of the quality of the comment. A student who asked only information questions typically received one point for the day, while more insightful contributions earned more points. Students who asked excellent, insightful questions typically earned three points for the day, but truly exceptional questions or comments could earn four points for the day. Participation is the sum of all participation points earned over the semester.

C. Controlling for Student Attributes

Innate ability is measured by students' SAT math scores (SAT Math) and SAT verbal scores (SAT Verbal). If a student took the SAT exam multiple times, then I include the highest SAT scores in the data set.[4] As noted earlier, some previous studies found that gender affected performance in introductory finance classes. To control for gender, I set a dummy variable, Gender, to zero for males and one for females.

III. Results

In section III, I discuss descriptive statistics for the dependent and independent variables, and I discuss my regression results.

A. Descriptive Statistics

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Exhibit 1 provides summary statistics for the dependent and independent variables for the final sample of 230 students. Over the sample period Exam Percent ranges from 25.3% to 96.0% with a mean and median of 72.7% and 74.5%, respectively. Total Absences ranges from zero to 17, with a mean of 3.1 and a median of two. When I separate absences into excused and unexcused, excused absences ranges from zero to six, with a mean of 0.4 and a median of zero. Unexcused absences ranged from zero to 17, with a mean of 2.7 and a median of two. The

[4] Although I collected both SAT and ACT scores for all students from the university registrar, I report only the results for SAT scores in this study, since more students applying to our school provided SAT scores (230 students) than ACT scores (130). Of the 267 students who took my class during the sample period, 117 took only the SAT, 17

number of times a student was late has a similar distribution with a range of zero to 14, but with a smaller mean and median of 1.4 and one. Participation points range from zero to 41 with a mean of 4.4 and a median of one.

Exhibit 1 shows that over the sample period, 43% of the students were required to work two semesters of old exams as homework. The remaining 57% were required to work only one semester of old exams as homework.

Exhibit 1 also shows that the number of homework days on which students demonstrated they were prepared by asking or answering homework questions ranges from zero to six, with an average of 2.2 and a median of two. The number of homework days students were unprepared or absent ranged from zero to two, with an average of 0.4 and a median of zero.

Exhibit 1 also summarizes student attributes. For students in the sample, SAT Math scores range from 380 to 800, with an average of 598 and a median of 590. SAT Verbal scores range from 320 to 750, with an average of 548.2 and a median of 550.

According to Baylor's "Profile of Undergraduate Students: Fall 2002 and Fall 2003", as of Fall 2002 57.7% of our undergraduates were female and as of Fall 2003, 58.3% were female. Although women make up over half of the student population at our university, only 24% of the students in Finance 4360 over the sample period were female.

Exhibit 2 shows the correlations between the dependent and independent variables. The only correlations that exceed 0.5 (or are less than -0.5) are those between the math and verbal SAT scores (ρ = 0.586). Students with more absences tend to be unprepared on homework days (ρ = 0.304) rather than prepared (ρ = -0.442). They also tend to be late (ρ = 0.214) and participate

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took only the ACT, and 113 took both the SAT and the ACT. Results using ACT scores were similar to those using SAT scores and are available on request.

less (ρ = -0.117). In addition, students who participated in class discussions tend to be prepared on homework days (ρ = 0.277) rather than unprepared (ρ = -0.128).

Although gender is not generally correlated with exam scores or effort variables, women do tend to be late less often (ρ = -0.134) and to participate less in class discussions (ρ = -0.142). I also note that SAT scores are not particularly correlated with any of the effort variables, except that those students with higher math SAT scores tend to participate more in class (ρ = 0.176).

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Insert Exhibit 2 around here

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B. The Impact of Effort on Performance

To examine the impact of effort on student performance, I estimate the following model:

$$EP_i = \beta_0 + \beta_1 HDP_i + \beta_2 HDU_i + \beta_3 D\_HDoub_i + \beta_4 TA_i + \beta_5 Late_i + \beta_6 Part_i + \beta_7 SATM_i + \beta_8 SATV_i + \beta_9 D\_Gen_i + \varepsilon_i \qquad (1)$$

In Equation (1), EP_i equals the exam points earned over the semester by student *i* as a percentage of possible exam points for the semester. Independent variables measuring homework-related student effort consist of HDP_i, the number of homework days on which student *i* gave evidence of being prepared by asking or answering questions about the homework; HDU_i, the number of homework days on which student *i* gave evidence of being unprepared by asking to be excused when called on, or by being absent when called on to discuss their homework; and D_HDoub_i, a dummy variable set to one for students who took the class when I assigned two semesters of exams as homework, and set to zero for semesters in which I assigned only one semester of exams as homework.

Additional independent variables that measure student effort consist of TA_i, the total number of days student *i* was absent; $Late_i$, the number of days student *i* was late to class; and $Part_i$, the class participation points earned by student *i*. Independent variables that measure ability or other non-effort-related variables consist of $SATM_i$, the highest SAT math score for student *i*; $SATV_i$, the highest SAT Verbal score for student *i*; and D_Gen_i, a dummy variable set equal to zero for males and one for females.

Since I believe effort has a positive impact on student performance, I expect the coefficient on HDP to be positive and the coefficient on HDU to be negative. Since I doubled the required homework in an effort to improve student learning in the course, I also expect the coefficient on D_HDoub to be positive.

I expect the coefficient on TA to be negative, since absences mean that a student does not receive the benefits of hearing the lecture and being able ask questions, and because absences seem to reflect a lack of effort to make it to class. The predicted sign for Late is also negative, since being late can indicate a lack of personal discipline and to some extent a lack of making the effort required to arrive for class on time. To the extent that student comments and questions during class indicate that a student is paying attention and is interested in the material, I expect the coefficient on Part to be positive.

The coefficients for variables that control for student attributes depends on the attribute being measured. Based on the results of Johnson, Joyce, and Sen and others, the expected signs of SATM and SATV coefficients are positive. Since previous studies find mixed results on the impact of gender on student performance, the predicted sign of the D_Gen coefficient is unclear.

The ordinary least squares test results for regression (1) shown in Table III, columns 1 and 2, provide evidence that making the effort to attempt homework problems has a significant positive impact on exam performance. The estimated coefficient for the number of homework days prepared (HDP) is positive and significant at the 5% level, and the estimated coefficient for the number of homework days unprepared (HDU) is negative and significant at the 1% level. In addition, the estimated coefficient for doubling the homework (D_HDoub) is positive and significant at the 1% level.

As predicted, the coefficient for absences (TA) is negative and significant at the 1% level. Although the coefficient for Late has the predicted sign, it is not significant at the 10% level. In addition, the coefficient for class participation (Part) is positive and significant at the 5% level. Thus, those students that were engaged during class, as evidenced by their comments and questions during class, tended to do better on exams.

The coefficients for both math (SATM) and verbal (SATV) SATs are positive, as predicted. However, although the coefficient for SATM is significant at the 1% level, the coefficient for SATV is not significantly different from zero at the 10% level. To the extent that SAT scores measure raw ability, this result indicates that quantitative skills are important determinants of performance on exams in my upper level finance classes.

The coefficient for gender (D_Gen) is positive but not significantly different from zero. This finding indicates that gender has no significant impact on performance once effort and ability are taken into consideration.

To control for possible nonlinear impacts of being absent and late, I add the squared number of absences (TA^2) and the squared number of tardies (Late^2) as independent variables. Columns 3 and 4 of Exhibit 3 show the impact of adding these variables. The sign of TA^2 is negative but not significantly different from zero. However, the sign for Late^2 is positive and significant at the 5% level. In addition, adding Late^2 makes the coefficient on Late more negative and significant at the 1% level. Thus, although being late appears to have a negative impact on exam performance, being late has less and less impact on exam grades if someone is routinely late. Perhaps being routinely late does not reflect a lack of effort or interest in my class, but stems instead from personal traits or from the student having a class just before mine that was across campus. Since there do not appear to be nonlinear effects for absences but there are nonlinear effects for being late, in columns 5 and 6 of Exhibit 3 I show the results when I include only Late^2.

Equation (2) serves as the basic model for most of the rest of the paper.

$$EP_i = \beta_0 + \beta_1 HDP_i + \beta_2 HDU_i + \beta_3 D\_HDoub_i + \beta_4 TA_i + \beta_5 Late_i + \beta_6 Late_i{}^\wedge 2 + \beta_7 Part_i + \beta_8 SATM_i + \beta_9 SATV_i + \beta_{10} D\_Gen_i + \varepsilon_i \quad (2)$$

In Equation (2), the new variable $Late_i$^2 equals the squared number of times student *i* was late for class. Previously defined variables consist of HDP_i, the number of homework days I counted student *i* as prepared; HDU_i, the number of homework days I counted student *i* as unprepared; D-_$HDoub_i$, a dummy variable set to one for students required to work exams from two semesters as homework and to zero for students required to work only one semester of exams as homework; TA_i, the number of days student *i* was absent; $Late_i$, the number of days student *i* was late; $Part_i$, the class participation points for student *i*; $SATM_i$, the highest SAT math score for student *i*; $SATV_i$, the highest SAT verbal score for student *i*; and D_Gen_i, a dummy variable set to zero for males and one for females.

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Insert Exhibit 3 around here

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C. The Impact of Excused Compared to Unexcused Absences

Exhibit 4 examines whether the impact of absences on exam performance depends on whether or not the absences were excused. As noted earlier, Excused Absences counts all absences for which a student was excused and Unexcused Absences counts all absences for which a student was not excused. To a considerable extent, excused absences are beyond the control of a student, but unexcused absences stem from a student's decision to skip class.

In Columns 1 and 2 of Table IV, I substitute Excused Absences and Unexcused Absences for Total Absences in Equation (2). The sign of the coefficient for Unexcused Absences is negative and significant at the 1% level. However, the sign for Excused Absences is positive but not significantly different from zero, with a p-value of 0.62. Thus, it appears that unexcused absences have a significant negative impact on exam grades, but that excused absences are unrelated to exam grades.

To test whether there is a significant difference between the impact of excused and unexcused absences on student performance, I add Excused Absences to Equation (2). Columns 3 and 4 of Exhibit 4 show that the coefficient on excused absences is positive and significant at the 10% level, which indicates a significant difference between the impact of excused and unexcused absences on exam scores.

The difference between the impact of excused and unexcused absences on exam scores provides further insight into the negative relation between absences and performance found in Exhibit 3 and in previous studies. Like excused absences, unexcused absences mean that the student misses any benefit from lectures and other activities. But unexcused absences further indicate a decision by the student to not make the effort to come to class. Based on the differences between the impact of excused and unexcused absences on exam scores, I conclude that lack of effort rather than lack of physical presence is what drives the negative relation between absences and student performance. Thus, in columns 5 and 6 of Table IV, I substitute unexcused absences for total absences in Equation (2).

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Insert Exhibit 4 around here

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D. The Impact of Volunteering Compared to Being Called On to Explain Homework

Although the results in Tables III and IV suggest that making an effort to work homework problems has a positive impact on student performance on exams, these tables make no distinction between the various ways in which students can demonstrate that that they have attempted the homework. Students can show me that they have attempted the homework problems by being prepared when I call on them, by asking a question about a problem, by volunteering to discuss their solutions to a problem, or by volunteering to correct the errors in a solution provided by another student.

Exhibit 5 separates the various ways that students can demonstrate whether they are prepared on days when the homework is discussed. Exhibit 5 shows that the total number of days on which students in my classes were called to discuss their solutions to the homework problems ranges from zero to three, with an average of 0.93 days. The number of days on which they were prepared when called on ranges from zero to three, with an average of 0.57 days. The number of days on which they were unprepared when called on ranges from zero to two, with an average of 0.27 days. And the number of days students were absent when called on ranges from zero to one, with an average of 0.08 days.

Exhibit 5 also separates the various ways in which students can voluntarily participate in the homework discussions. The number of days on which students in my classes voluntarily participated in discussions of the homework by asking a question or volunteering to discuss their solutions ranges from zero to five, with an average of 1.8 days. The number of days on which they asked questions ranges from zero to five, with a mean of 0.83 days. The number of days on which students volunteered to show and discuss their solutions ranges from zero to three, with an average of 1.02 days. And the number of days on which students volunteered to correct errors in the solutions of another student ranges from zero to three, with an average of 0.22 days.

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Insert Exhibit 5 around here

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To separate the impact of voluntary and involuntary participation on homework days, I estimate the following model:

$$EP_i = \beta_0 + \beta_1 HDCP_i + \beta_2 HDU_i + \beta_3 HDVQ_i + \beta_4 D\_HDoub_i + \beta_5 UA_i + \beta_6 Late_i + \beta_7 Late_i\text{^}2 + \beta_8 Part_i + \beta_9 SATM_i + \beta_{10} SATV_i + \beta_{11} D\_Gen_i + \varepsilon_i \quad (3)$$

In Equation (3), new variables consist of $HDCP_i$, which equals the number of days on which student *i* was prepared when called on to show and discuss their solutions; $HDVQ_i$, which equals the number of days on which a student voluntarily participated in the discussion by either asking a question or by volunteering to show and explain their solutions to the homework problems; and UA_i, which equals the number of unexcused absences for student *i*. Previously defined variables consist of HDU_i, which equals the number of homework days I counted student *i* as unprepared; D_HDoub_i, which equals one for students required to work two semesters of exams as homework and zero for students required to work one semester of exams as homework; $Late_i$, which equals the number of days student *i* was late; $Late_i$^2, which equals $Late_i$ squared; $Part_i$, which equals the class participation points for student *i*; $SATM_i$, which equals the highest SAT math score for student *i*; $SATV_i$, which equals the highest SAT verbal score for student *i*; and D-_Gen_i, which equals zero for males and one for females.

Columns 1 and 2 of Exhibit 6 show that the coefficient for Homework Days Called On: Prepared is positive and significant at the 10% level, and that the coefficient for Homework Days Called on: Unprepared or Absent is negative and significant at the 1% level. However, although the coefficient for Homework Days Volunteered or Question is positive, it is not significant at the 10% level (p-value of 0.184). Thus, it appears that while being prepared rather than unprepared when called on has a significant impact on exam performance, voluntarily participating in homework discussions by asking or answering questions does not.

To differentiate between being unprepared and being absent when called on to discuss homework solutions, in Equation (3) I substitute $HDCU_i$ and $HDCA_i$ for HDU_i, and to differentiate between the various ways students can voluntarily participate in homework discussions, I substitute $HDAQ_i$, $HDVS_i$, and $HDCS_i$ for $HDVQ_i$. I define these variables as follows. $HDCU_i$ is the number of days a student asked to be excused when called on and $HDCA_i$ is the number of days a student was absent when called on. $HDAQ_i$ is the number of days a student asked questions about the homework; $HDVS_i$ is the number of days a student volunteered to show and discuss their solutions to the homework; and $HDCS_i$ is the number of days a student volunteered to correct errors in the solution of another student.

Columns 3 and 4 of Exhibit 6 show that making distinctions between the various ways a student can show they are unprepared and between the various ways a student can voluntarily participate in homework discussions does not change the previous results. The coefficients for both HDCU and HDCA are negative and significant at the 1% and 5% levels, respectively. In addition, none of the coefficients on the voluntary participation variables is significantly different from zero. Columns 5 and 6 of Exhibit 6 present the results of including both HDCU and HDCA and dropping all voluntary homework discussion variables.

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Insert Exhibit 6 around here

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E. Does Calling On Students Motivate Them?

To examine whether calling on students early in the semester motivates them to work harder for the rest of the semester for fear of being called on again in the future, I estimate the following model:

$$EP_i = \beta_0 + \beta_1 D\_C1HWD_i + \beta_2 HDCP_i + \beta_3 HDCU_i + \beta_4 HDCA_i + \beta_5 D\_HDoub_i + \beta_6 UA_i \\ + \beta_6 Late_i + \beta_7 Late_i\hat{}2 + \beta_8 Part_i + \beta_9 SATM_i + \beta_{10} SATV_i + \beta_{11} D\_Gen_i + \varepsilon_i \qquad (4)$$

In Equation (4), I add D_C1HWD_i , which is a dummy variable set to one if student *i* is called on to discuss homework solutions on the first homework day, and zero otherwise; $HDCU_i$, which is the number of days student *i* was unprepared when called on to discuss homework solutions; and $HDCA_i$, which is the number of days student *i* was absent when called on to discuss homework solutions. Previously defined variables consist of $HDCP_i$, the number of days student *i* was prepared when called on to show and discuss their solutions; D_HDoub_i, a dummy variable set to one for students required to work two semesters of exams as homework and set to zero for students required to work one semester of exams as homework; UA_i, the number of unexcused absences for student *i*; $Late_i$, the number of days student *i* was late; $Late_i$^2, the squared number of times student *i* was late; $Part_i$, the class participation points for student *i*; $SATM_i$, the highest SAT math score for student *i*; $SATV_i$, the highest SAT verbal score for student *i*; and D_Gen_i, a dummy variable set to zero for males and one for females.

For each semester in the sample, the first two homework days occur before the first exam for the semester and the remaining homework days occur after the first exam. Thus, I substitute D_C2HWD$_i$ for D_C1HWD$_i$, where D_C2HWD$_i$ is a dummy variable set to one if student *i* is called on during either of the first two homework days, and zero otherwise.

The results in Exhibit 7 provide no evidence that calling on students motivates them. In columns 1 and 2, the coefficient for D_C1HWD is not significantly different from zero. In columns 3 and 4, the coefficient for D_C2HWD is also not significantly different from zero.

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Insert Exhibit 7 around here

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F. Further Isolating Variables over which Students Have Control

Many of the variables I use to measure student effort depend on decisions both I and the students make. The number of days students are prepared or unprepared when I call on them depends on the number of days I call on each student and on each student's decision on whether to work the homework problems before coming to class. The number of days a student voluntarily participates in homework discussions depends on the number of days I set for homework discussions and on the student's decision on whether or not to participate on any particular homework day. Similarly, students have no control over the number of days I take attendance, but they do control whether they attend class, arrive on time, and participate.

To isolate the impact of variables over which students have control from the impact of those over which students have no control, I estimated the following model:

$$EP_i = \beta_0 + \beta_1 DC_i + \beta_2 PPWC_i + \beta_3 HD_i + \beta_4 PHDVQ_i + \beta_5 D\_HDoub_i + \beta_5 AD_i + \beta_6 PUA_i + \beta_6 PLate_i + \beta_7 PLate_i\text{^}2 + \beta_8 PPD_i + \beta_9 SATM_i + \beta_{10} SATV_i + \beta_{11} D\_Gen_i + \varepsilon_i \qquad (5)$$

In Equation (5), DC_i is the number of days I called on student *i* to discuss homework solutions and $PPWC_i$ equals the percent of time student *i* was prepared when called on. (Since $PPWC_i$ is undefined for any student who was not called on during the semester, I limit the sample to the 149 students who were called on during the semester.) HD_i is the total number of days on which homework was discussed when student *i* took the course, and $PHDVQ_i$ is the percentage of homework days on which student *i* asked a question or volunteered to discuss their solutions. I define AD_i as the number of days I took attendance when student *i* took the course. PUA_i is the percentage of attendance days on which the student *i* had an unexcused absence; $PLate_i$ is the percentage of attendance days on which student *i* was late; and PPD_i is participation per day. Previously defined variables in Equation (5) consist of the following. D_HDoub_i is a dummy variable set to one for students required to work two semesters of exams as homework and set to zero for students required to work one semester of exams as homework. $SATM_i$ is the highest SAT math score for student *i*. $SATV_i$ is the highest SAT verbal score for student *i*. And D_Gen_i is a dummy variable set to zero for males and one for females.

The results in Exhibit 8 show that the positive relation between student effort and student performance on exams is driven by factors students control, but unrelated to those factors beyond their control. The coefficients for DC, HD, and AD are all not significantly different from zero. However, the coefficients for variables over which students have control are generally consistent with earlier results, except that the coefficients for the variables that measure tardiness and class participation are no longer significantly different from zero.

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Insert Exhibit 8 around here

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IV. Conclusion

Although many previous studies examine the determinants of student performance, most of them focus on what a student brings into the class (such as admittance scores or previous grades) rather than on student input into the course. Those studies that do focus on student input find mixed results on whether student effort has a positive impact on performance. These mixed, even contradictory, results are surprising, since most educators believe that effort plays a significant role in the performance of students in their classes.

Using observed rather than self-reported measures of effort to learn, I find evidence that effort has a positive impact on student performance. The most direct measure of effort I use is whether students attempt to work the assigned homework problems. I count students as having attempted the homework if they are prepared when I call on them to discuss their homework solutions, if they ask a question, or if they volunteer to discuss their solutions to the homework problems. Since incorrect answers do not negatively impact a student's homework grade, but being unprepared does, students have an incentive (and are encouraged) to show their solutions even if they are incorrect. As a result, whether a student is counted as prepared or unprepared when called on to discuss their solutions indicates effort more than understanding.

I find a significant positive relation between exam performance and the number of days a student is prepared, and a significant, negative relation between exam performance and the number of days a student is unprepared. I also find that of those students who are called on, performance on exams is significantly and positively related to the percentage of the time the student is prepared when called on to discuss the homework.

One final piece of evidence that working homework improves student performance is that students performed significantly better on exams during those semesters when I doubled the amount of required homework.

Although I find a positive relation between student performance and effort to attempt the homework, I did not find any evidence that calling on students motivates them to work harder: I find no relation between exam performance and the number of times I called on a student. I also find no relation between student performance and whether or not I called on the student on the first or second day we discussed homework.

Although being prepared when called on to discuss homework solutions is positively related to exam performance, I find no relation between voluntary participation on homework days and exam performance: there is no relation between student performance on exams and asking questions about the homework, volunteering to discuss homework solutions, or volunteering to correct the solutions of other students. These results may stem from personality differences between those students who volunteer and those who do not, or may be due to my choosing between multiple volunteers based on who has discussed homework solutions the least during prior discussions of homework.

Further evidence of the impact of effort on student performance comes from the negative relation between student performance and absences, and the positive relation between student performance and participation in class discussions. However, the negative relation between absences and exam performance applies only to unexcused absences, not to excused absences. The significantly different impact of excused and unexcused absences on exam performance seems to indicate that the primary impact of attendance on performance stems from the effort to attend class, rather than from any benefits of being physically present in class.

I find relations between various student attributes (unrelated to effort) and exam performance that are consistent with previous studies. Students with higher math aptitude, as indicated by higher SAT math scores, did significantly better on exams. Consistent with some (but not all) previous studies, I also find that that once differences in effort and ability are accounted for, gender has no explanatory power for performance on exams.

These results would not be surprising, except that previous evidence on effort has found mixed results as to whether effort has a positive or negative impact on student performance. Based on my results, I believe that teachers can continue to encourage their students to put more effort into their courses, and that teachers can with good conscience tell students that on average, such effort should result in better performance in their classes.

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Exhibit 1. Summary Statistics for Students Who Took Finance 4360 from Spring 2002 Through Summer 2003

The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. Exam Percent equals each student's total exam points as a percentage of the possible exam points for the semester. Total Absences is the total number of times a student missed class, Excused Absences is absences excused for medical or university-sanctioned activities, and Unexcused Absences is the difference between Total and Excused Absences. Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. Homework Doubled is a dummy variable set to zero for semesters when only one semester of past exams were assigned as homework, and one for semesters when two semesters of past exams were assigned as homework. Homework Days Prepared is the number of homework days on which each student gave evidence of being prepared by asking or answering questions about the homework, and Homework Days Unprepared is the number of homework days on which a student elected to not answer or was absent when called on. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
Exam Percent	72.67	11.88	25.33	65.58	74.50	80.05	96.00
Student Effort							
Total Absences	3.12	3.24	0.00	0.00	2.00	5.00	17.00
Excused Absences	0.40	1.01	0.00	0.00	0.00	0.00	6.00
Unexcused Absences	2.72	3.09	0.00	0.00	2.00	4.00	17.00
Late	1.41	2.14	0.00	0.00	1.00	2.00	14.00
Participation	4.37	6.93	0.00	0.00	1.00	6.00	41.00
Homework Doubled	0.43	0.50	0.00	0.00	0.00	1.00	1.00
Homework Days:							
Prepared	2.20	1.20	0.00	1.00	2.00	3.00	6.00
Unprepared or Absent	0.35	0.58	0.00	0.00	0.00	1.00	2.00
Student Attributes							
SAT Math	598.04	75.36	380.00	550.00	590.00	650.00	800.00
SAT Verbal	548.17	76.31	320.00	490.00	550.00	600.00	750.00
Gender Dummy	0.24	0.43	0.00	0.00	0.00	0.00	1.00

Exhibit 2. Correlations Between Selected Variables

This table presents correlations between selected variables for the sample of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. Exam Percent is each student's total exam points as a percentage of the possible exam points for the semester. Prepared is the number of homework days on which each student gave evidence of being prepared by asking or answering questions about the homework, and Unprepared is the number of homework days on which a student elected to not answer or was absent when called on. Total Absences is the total number of times a student missed class, and Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

	Exam Percent	Prepared	Unprepared	Absences	Late	Participation	SATM	SATV
Exam Percent	1.000	-	-	-	-	-	-	-
Prepared	0.365	1.000	-	-	-	-	-	-
Unprepared	-0.367	-0.209	1.000	-	-	-	-	-
Total Absences	-0.420	-0.442	0.304	1.000	-	-	-	-
Late	-0.189	-0.116	0.062	0.214	1.000	-	-	-
Participation	0.232	0.277	-0.128	-0.117	0.073	1.000	-	-
SAT Math	0.392	0.064	-0.047	0.010	-0.111	0.176	1.000	-
SAT Verbal	0.322	0.103	-0.036	-0.060	-0.059	0.095	0.586	1.000
Gender Dummy	0.026	0.092	-0.065	-0.075	-0.134	-0.142	-0.063	-0.060

Exhibit 3. The Impact of Effort and Ability on Student Performance

I use ordinary least squares to estimate the impact of effort and ability on student performance. The dependent variable is each student's total exam points as a percentage of possible exam points for the semester. Homework Days Prepared is the number of homework days each student asked or answered questions about the homework. Homework Days Unprepared is the number of homework days each student asked to be excused or was absent when called on to answer questions about the homework. Homework Doubled is a dummy variable set to zero for semesters when only one semester of past exams were assigned as homework, and to one for semesters when two semesters of past exams were assigned as homework. Total Absences is the total number of times a student missed class. Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females. The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003.

Dependent Variable: Exam Percent

Variable	Parameter Estimate	P-value	Parameter Estimate	P-value	Parameter Estimate	P-value
Intercept	36.027	0.000	36.954	0.000	37.039	0.000
Homework Days Prepared	1.345	0.021	1.426	0.015	1.350	0.020
Homework Days Unprepared	-4.388	0.000	-4.487	0.000	-4.516	0.000
Homework Doubled	3.847	0.003	3.868	0.003	3.828	0.003
Total Absences	-0.821	0.000	-0.289	0.574	-0.722	0.001
Total Absences Squared			-0.042	0.350		
Late	-0.280	0.342	-1.734	0.007	-1.674	0.009
Late Squared			0.172	0.011	0.167	0.014
Participation	0.192	0.046	0.166	0.081	0.166	0.081
SAT Math	0.047	0.000	0.047	0.000	0.048	0.000
SAT Verbal	0.014	0.149	0.013	0.192	0.012	0.196
Gender Dummy	0.516	0.719	0.511	0.720	0.389	0.784
Number of Observations	230		230		230	
Adjusted R-squared	0.423		0.436		0.436	

Exhibit 4. The Impact of Excused Compared to Unexcused Absences

The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. I use ordinary least squares to estimate and compare the impact of excused, and unexcused, and total absences on student performance. The dependent variable is each student's total exam points as a percentage of possible exam points for the semester. Homework Days Prepared is the number of homework days each student asked or answered questions about the homework. Homework Days Unprepared is the number of homework days each student asked to be excused or was absent when called on to answer questions about the homework. Homework Doubled is a dummy variable set to zero for semesters when only one semester of past exams were assigned as homework and one for semesters when two semesters of past exams were assigned as homework. Total Absences is the total number of times a student missed class. Excused Absences counts only those absences for which a student was excused due to medical reasons or a university excuse such as a team sport event, and Unexcused Absences counts all absences that were not excused. Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

Dependent Variable: Exam Percent

Variable	Parameter Estimate	P-value	Parameter Estimate	P-value	Parameter Estimate	P-value
Intercept	38.108	0.000	38.108	0.000	37.978	0.000
Homework Days Prepared	1.255	0.029	1.255	0.029	1.242	0.031
Homework Days Unprepared	-4.170	0.000	-4.170	0.000	-4.212	0.000
Homework Doubled	3.899	0.003	3.899	0.003	3.834	0.003
Total Absences			-0.868	0.000		
Excused Absences	0.294	0.622	1.162	0.067		
Unexcused Absences	-0.868	0.000			-0.872	0.000
Late	-1.659	0.009	-1.659	0.009	-1.637	0.009
Late Squared	0.169	0.012	0.169	0.012	0.166	0.013
Participation	0.160	0.090	0.160	0.090	0.161	0.088
SAT Math	0.046	0.000	0.046	0.000	0.046	0.000
SAT Verbal	0.013	0.190	0.013	0.190	0.013	0.192
Gender Dummy	0.230	0.871	0.230	0.871	0.266	0.851
Number of Observations	230		230		230	
Adjusted R-squared	0.443		0.443		0.444	

Exhibit 5. Statistics on Homework for Students Who Took Finance 4360 from Spring 2002 Through Summer 2003

The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. Homework Days: Called On: Total is the number of homework days on which a student was called on during the semester to show and discuss their homework solutions. When called on, a student may be either Prepared, Unprepared, or Absent. Homework Days: Volunteered or Question is the total number of days a student either asked a question or volunteered to show and discuss their solutions (including corrections). Homework Days: Asked a Question is the number of days a student asked a question about the homework. Homework Days: Volunteered Solution is the number of days a student volunteered to show a solution to a homework problem and answer questions from the class about the solution. Homework Days: Corrected Solution is the number of days a student volunteered to correct another student's solution and to discuss the correction. I note that students might have been called on, asked a question, and volunteered to show and discuss their solutions all on the same homework day.

	Mean	Std. Dev.	Min.	1Q	Median	3Q	Max.
Homework Days:							
Called On: Total	0.93	0.84	0.00	0.00	1.00	1.00	3.00
Called On: Prepared	0.57	0.74	0.00	0.00	0.00	1.00	3.00
Called On: Unprepared	0.27	0.51	0.00	0.00	0.00	0.00	2.00
Called On: Absent	0.08	0.27	0.00	0.00	0.00	0.00	1.00
Called On: Unprepared or Absent	0.35	0.58	0.00	0.00	0.00	1.00	2.00
Volunteered or Question	1.80	1.19	0.00	1.00	2.00	3.00	5.00
Asked a Question	0.83	1.05	0.00	0.00	0.00	1.00	5.00
Volunteered Solution	1.02	0.78	0.00	0.00	1.00	1.00	3.00
Corrected Solution	0.22	0.46	0.00	0.00	0.00	0.00	3.00

Exhibit 6. The Impact of Voluntary Compared to Involuntary Discussions of Homework

The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. I use ordinary least squares to estimate and compare the impact of voluntary and involuntary discussions of homework on student performance. The dependent variable is each student's total exam points as a percentage of possible exam points for the semester. Days Called On is the number of homework days on which a student was called on to show and discuss solutions to the homework problems. When called on, a student may be either Prepared, Unprepared, or Absent. Days Volunteered or Question is the total number of days a student either asked a question or volunteered to show and discuss solutions (including corrections). Days Asked a Question is the number of days a student asked a question about the homework. Days Volunteered Solution is the number of days a student volunteered to show a solution to a homework problem and answer questions from the class about the solution. Days Corrected Solution is the number of days a student volunteered to correct another student's solution and to discuss the correction. Homework Doubled is a dummy variable set to zero for semesters when only one semester of past exams were assigned as homework and to one for semesters when two semesters of past exams were assigned as homework. Unexcused Absences is all absences that were not excused. Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

Dependent Variable: Exam Percent

Variable	Parameter Estimate	P-value	Parameter Estimate	P-value	Parameter Estimate	P-value
Intercept	38.352	0.000	39.458	0.000	39.590	0.000
Days Called On: Prepared	1.630	0.052	1.786	0.042	1.511	0.072
Days Called On: Unprepared			-3.524	0.005	-3.641	0.003
Days Called On: Absent			-5.044	0.031	-5.218	0.024
Days Called On: Unprep/absent	-3.986	0.000				
Days Volunteered or Question	0.777	0.184				
Days Asked a Question			-0.359	0.579		
Days Volunteered Solution			0.719	0.411		
Days Corrected Solution			1.419	0.296		
Homework Doubled	3.931	0.002	3.540	0.009	4.020	0.002
Unexcused Absences	-0.897	0.000	-0.955	0.000	-0.992	0.000
Late	-1.632	0.010	-1.633	0.011	-1.628	0.011
Late Squared	0.166	0.014	0.163	0.018	0.165	0.015
Participation	0.189	0.052	0.230	0.023	0.236	0.011
Math SAT	0.046	0.000	0.044	0.000	0.045	0.000
Verbal SAT	0.013	0.173	0.015	0.133	0.014	0.146
Gender Dummy	0.200	0.888	0.584	0.686	0.436	0.759
Number of Observations	230		230		230	
Adjusted R-squared	0.443		0.436		0.440	

Exhibit 7. The Impact of Calling on Students to Show Their Homework Solutions

The sample consists of 230 students who took my senior-level corporate finance class from Spring 2002 through Summer 2003. I use ordinary least squares to estimate the impact of calling on students to discuss their homework solutions early in the semester. The dependent variable is each student's total exam points as a percentage of possible exam points for the semester. Called on First Homework Day is a dummy variable set to one if a student is called on to show and discuss solutions on the first homework day, and to zero otherwise. Called on First or Second Homework Day is a dummy variable set to one if a student is called on during the first or second homework day, and to zero otherwise. Days Called On is the total number of homework days on which a student was called on to show and discuss solutions to the homework problems. When called on, a student may be either Prepared, Unprepared, or Absent. Homework Doubled is a dummy variable set to zero for semesters when only one semester of past exams were assigned as homework, and to one for semesters when two semesters of past exams were assigned as homework. Unexcused Absences is all absences that were not excused. Late is the number of times a student came in to class after attendance was taken. Participation is the class participation points earned by each student for the semester. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

Dependent Variable: Exam Percent

Variable	Parameter Estimate	P-value	Parameter Estimate	P-value
Intercept	39.541	0.000	40.292	0.000
Called on First Homework Day	0.833	0.609		
Called on First or Second Homework Day			-1.354	0.407
Days Called On: Prepared	1.343	0.136	1.900	0.051
Days Called On: Unprepared	-3.900	0.004	-3.065	0.030
Days Called On: Absent	-5.163	0.026	-5.335	0.022
Homework Doubled	4.031	0.002	3.961	0.002
Unexcused Absences	-0.995	0.000	-0.996	0.000
Late	-1.627	0.011	-1.668	0.009
Late Squared	0.163	0.016	0.171	0.012
Participation	0.239	0.011	0.232	0.013
Math SAT	0.045	0.000	0.045	0.000
Verbal SAT	0.014	0.154	0.014	0.157
Gender Dummy	0.474	0.739	0.404	0.776
Number of Observations	230		230	
Adjusted R-squared	0.438		0.439	

Exhibit 8. Separating Being Called on from Being Prepared

I use ordinary least squares to separate the impact on student performance of being called on from being prepared, of the number of homework days from volunteering, and for the number of days on which attendance was taken from attendance, being late, and participating in class discussions. Since I include in the sample only those students who were called on, the sample size falls from the 230 students who took my senior-level corporate finance class from Spring 2002 through Summer to 2003 to the 149 who were called on during those semesters. Days Called On is the number of homework days on which a student was called on to show and discuss solutions to a homework problems. Percent Prepared when Called On is the number of days a student was prepared when called on divided by the number of days the student was called on. Homework Days is the total number of homework days in the section a student attended. Percent Days Volunteered or Asked Question is the number of days a student volunteered or asked a question, divided by the total number of homework days. Percent Days Asked Question, Percent Days Volunteered Solution, and Percent Days Volunteered Correction are, respectively, the number of days a student asked a question, volunteered a solution, or volunteered to correct another student's solution, divided by the total number of homework days. Days Attendance Taken is the total number of days on which I took attendance in each student's section. Percent Unexcused Absences and Percent Late is the number of days a student had an unexcused absence or was late, divided by the number of days I took attendance. Participation Per Day indicates each student's participation points for the semester divided by the number of days on which I took attendance. SAT Math is the highest math SAT score for the student, and SAT Verbal is the highest verbal SAT verbal score for the student. Gender Dummy is a dummy variable set to zero for males and to one for females.

Dependent Variable: Exam Percent

Variable	Parameter Estimate	P-value	Parameter Estimate	P-value
Intercept	42.085	0.000	44.487	0.000
Days Called On	-0.900	0.482	-1.056	0.427
Percent Prepared when Called on	0.052	0.005	0.048	0.009
Homework Days	-1.741	0.310	-1.901	0.278
Percent Days Volunteered or Asked Question	0.029	0.457		
Percent Days Asked Question			0.008	0.853
Percent Days Volunteered Solution			-0.031	0.624
Percent Days Volunteered Correction			0.084	0.406
Homework Doubled	5.542	0.001	5.496	0.001
Days Attendance Taken	-0.037	0.762	-0.015	0.900
Percent Unexcused Absences	-0.565	0.000	-0.612	0.000
Percent Late	0.003	0.991	-0.003	0.991
Percent Late Squared	-0.000	0.943	0.000	0.977
Participation per day	4.408	0.170	4.767	0.142
Math SAT	0.052	0.000	0.053	0.000
Verbal SAT	0.155	0.251	0.013	0.353
Gender Dummy	0.640	0.713	0.613	0.729
Number of Observations	149		149	
Adjusted R-squared	0.504		0.499	