Factors Associated with Student Performance in Investment Portfolio Management: An Empirical Study at a US Residential Public University

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This paper examines some determinants of student performance in Investment Portfolio Management. Of the motivation factors studied, only the grade the student intends to earn has some association with student performance. Of the effort factors used, only class participation and homework have positive effect on student performance. None of the distraction factors studied (job hours, job type, and course load) has any effect on student performance. Prior ability factors (the grade in a pre-requisite investment course, and GPA) have significant association with student performance. Finally, none of the self-perceived abilities (writing, math, reading, and listening) has any association with student performance.

INTRODUCTION

Several prior research studies have explored various factors (e.g., general academic performance, aptitude, prior exposure to mathematics, prior exposure to accounting, age, gender, motivation, effort, and other intervening variables) that are associated with student performance in college-level courses. It is widely believed that motivation and effort significantly influence individual performance in college. However, as the review of prior research below indicates, very few studies have investigated their impact on required undergraduate Financial Management course. None, that we are aware of, has looked at determinants of success in an Investment Portfolio Management course which is required for most finance majors and taken by many non-finance majors as an elective. This study investigates the associations between selected motivation, effort, distraction, self-perceived ability, and prior ability factors and student performance in the undergraduate Investment Portfolio Management course.

As proxies for motivation, we use the grade the students would like to make in the course, intention to take the Chartered Financial Analyst (CFA) or the Certified Financial Planner (CFP) examination, and intention to attend graduate school. As proxies for effort, we use class participation, homework grade, and the number of weekly study hours for the course. As proxies for distraction, we use the number of hours of work per week, the type of job (whether or not it is accounting, finance, or business related) and the number of courses taken per semester. We measure students' self-perceived abilities using their own self-reported math, writing, reading, and listening abilities. Students' prior ability is measured by the actual grade earned in the Investments course which is a pre-requisite for the Investment Portfolio

Management course and overall Grade Point Average (OGPA). The dependent variable, the student performance, is measured in three different ways; by the letter grade for the course, total overall points percent score for the course, and by the percent score in tests given in class.

One of the motivations of this study is predicated on the belief that identifying effort factors that help students to perform well and factors that distract them from performing well may help us emphasize the effort factors and discourage the distraction factors. Another purpose of the study is to provide empirical support to the intuitive notion that motivation does indeed lead to better student performance. Also the study could help us determine whether students' self-assessment of their own writing, math, reading, and listening abilities affect their performance in the course.

The remaining parts of the paper present a review of prior research, discussion of the study objectives, variables and hypotheses, research methodology, and results. The paper ends with conclusions, recommendations, study limitations, and some suggestions for further research.

REVIEW OF PRIOR RESEARCH

Prior studies have explored various factors (e.g., general academic performance, aptitude, prior exposure to mathematics, prior exposure to accounting, gender, age, motivation, effort, and other intervening variables) that are associated with student performance in college-level courses. The overall Grade Point Average (OGPA) is used frequently as a proxy for prior academic performance and aptitude.

In the finance area, Paulsen and Gentry (1995), Chan, Shum, and Wright (1997), Sen, Joyce, Farrel, and Toutant (1997), Didia and Hasnat (1998), Marks (1998), Van Ness, Van Ness, and Adkins (2000), Johnson, Joyce, and Sen (2002), Biktimirov and Klassen (2008), find OGPA to be a strong predictor of grade in the Financial Management course that is required of all business majors. Several researchers, using data from various U.S. colleges, find evidence supporting OGPA as a significant predictor of performance in accounting courses (Eckel and Johnson 1983; Hicks and Richardson 1984; Ingram and Peterson 1987; Eskew and Faley 1988; Doran, Bouillon, and Smith 1991; Maksy and Zheng 2008; Maksy 2012 and 2014; Gupta and Maksy 2014; and Maksy and Wagaman 2012, 2013, and 2015). Wooten (1998) finds that aptitude, as measured by the Scholastic Aptitude Test (SAT) score, and grade history are significant variables in influencing performance of students in an introductory accounting course. U.S. research findings are supported in Australia by Jackling and Anderson (1998) and in Scotland by Duff (2004). In Wales, Lane and Porch (2002) find that performance in introductory accounting can partially be explained by reference to factors in the students' pre-university background. However, these factors are not significant when the student progresses to upper level accounting classes. In addition, using another measure, pre-university examination performance, Gist, Goedde, and Ward (1996) find no significant association between academic performance and performance in accounting courses at the university level.

Finance and accounting are subject areas that require accumulation of prior knowledge and quantitative skills. Thus, several studies have investigated the impact of prior exposure to mathematics and accounting on performance in college finance and accounting courses. With regard to Financial Management courses, the evidence is mixed. While Chan, Shum and Wright (1997) show that self-reported quantitative skills have insignificant impact on students' course score, Grover, Heck and Heck (2010) report significant explanatory power for pre-test math, accounting and economics scores. Didia and Hasnat (1998) find mixed results with math grade being significant predictor of course grade for OLS model but not for the ordered-probit model. However, they find strong evidence, using both OLS and ordered-probit estimates, that grades in accounting and economics pre-requisite courses have predictive value for the Financial Management course. Sen, Joyce, Farrell and Toutant (1997) also find positive association between completion of pre-requisites and performance in the Financial Management course.

Financial Management pre-requisites almost always include two accounting courses. In the accounting area, the results are also inconclusive. On one hand, some studies (for example, Baldwin and Howe 1982; Bergin 1983; and Schroeder 1986) find that performance is not significantly associated with prior exposure to high school accounting education. On the other hand, some later studies (for example,

Eskew and Faley 1988; Bartlett et al 1993; Gul and Fong 1993; Tho 1994; Rohde and Kavanagh 1996) find that prior accounting knowledge, obtained through high school education, is a significant determinant of performance in college-level accounting courses. There is also some ambiguity with regard to the influence of mathematical background on performance in accounting courses. For example, Eskew and Faley (1988) and Gul and Fong (1993) suggest that students with strong mathematical backgrounds outperform students with weaker mathematical backgrounds. On the other hand, Gist et al. (1996) do not report the same results. Furthermore, Guney (2009) suggests that grades in secondary education mathematics are a very strong determinant of performance in accounting but only for non-accounting majors.

Prior studies about the influence of motivation and effort on student performance also report conflicting results. For example, Pascarella and Terenzini (1991), report that motivation and effort, among other factors, significantly influence students' performance in college. Wooten (1998) finds that motivation significantly affects effort which in turn significantly affects performance in an introductory accounting course. Maksy and Zheng (2008) use "the grade the student would like to make in the course" as a proxy for motivation and find it to be significantly associated with the student's performance in advanced accounting and auditing courses. Paulsen and Gentry (1995), using a survey instrument, report that students' academic performance in a large introductory Financial Management course was significantly related to several motivational variables such as intrinsic and extrinsic goal orientations and task value, and learning strategy variables, including time, study, and effort. Johnson, Joyce and Sen (2002) utilize computerized quizzes and analyze the effect of objectively measured effort on student performance in Financial Management course. They show that, after controlling for aptitude, ability, and gender, effort as measured by attempts and log time, remains significant in explaining the differences in performance. Rich (2006), uses students' homework preparedness and unpreparedness in class as a proxy of effort and non-effort. He finds significant positive association for the former and negative association for the latter with exam percent. Biktimirov and Klassen (2008) find weak association between hits to course management system and grade in finance course. However, using self-reported data, Didia and Hasnat (1998) present very week counter-intuitive evidence for one of the two OLS models, but not for the ordered-probit models, that the more time spent studying per week the lower the grade in the introductory finance course. However, they did not control for GPA. Also, using self-reported data, Nofsinger and Petry (1999) find no significant association between effort and performance in a Principles of Finance course.

In recent years, there has been increased interest in studying the influence of intervening variables on student performance. Paulsen and Gentry (1995), using a survey instrument, find that academic performance in a large introductory financial management class is significantly related to control over learning, test anxiety, self-efficacy, elaboration, organization and metacognition. Wooten (1998) finds no significant association between work, family, and extra-curricular conflicts and students' performance in an introduction to accounting course. Chan, Shum, and Wright (1997) find no significant association between performance in a financial management course and attendance, credit hours enrolled, and number of weekly work hours. In a similar vein, Van Ness et al. (2000) find no association between students' full time or part time status and grades in a Principles of Finance class. However, they find that students who are enrolled in internet class are more likely not to complete the course. This appears to be contrary to Paulsen and Gentry finding because that internet course was designed to give students more control over their learning in terms of very flexible deadline for assignments and one full year to complete the course. Didia and Hasnat (1998) find strong positive association between number of credit hours enrolled in the semester and course grades. This result may seem to be counter intuitive; however, some research shows that students with higher GPAs tend to take more courses per semester. Rich (2006) reports significant negative association between class absences and being late to the class and exam percent. In the accounting area, Wooten (1998) does not find significant association between course performance and work, family, and extracurricular conflicts. Paisey and Paisey (2004) and Guney (2009) show there is a clear positive association between attendance and academic performance in accounting courses. Paisey and Paisey also report that the most frequently cited reason for not attending classes was

students' participation in part-time employment. Similarly, Lynn and Robinson-Backmon (2005) find a significant adverse association between employment status and learning outcomes in upper-division accounting courses. They also indicate that a student's self-assessment of course learning objectives is significantly and directly related to grade performance. In contrast, Maksy and Zheng (2008), Maksy (2012 and 2014), Gupta and Maksy (2014), and Maksy and Wagaman (2012, 2013, and 2015) find no significant negative association between the number of work hours per week and student performance in accounting, auditing, and investments courses. Schleifer and Dull (2009) address metacognition in students and find a strong link between metacognitive attributes and academic performance. Metacognition is frequently described as "thinking about thinking" and includes knowledge about when and how to use particular strategies for learning or for problem solving.

Age and gender are two demographic variables that receive less attention than those factors discussed above, but the results are still inconclusive. Chan, Shum, and Wright (1997), Didia and Hasnat (1998), and Van Ness et al. (2000) find no significant association between grade in an introductory finance course and gender or age of students. Henebry and Diamond (1998) and Johnson et al. (2002) also do not find any significant association between a finance principles course score and gender of students. However, Henebry and Diamond (1998) show that both male and female students earn significantly higher grades in courses taught by female instructors. This difference was not attributable to adjunct, tenure track, or tenured status of instructors. Sen et al. (1997), on the other hand, show that female student performed worse than male students in principles of finance courses at two different mid-western universities. In the field of accounting, Bartlett et al. (1993) and Kohl and Kohl (1999) suggest that younger students have better performance, particularly at the senior university level. However, Jenkins (1998) and Lane and Porch (2002) conclude that age is not a significant determinant of performance in auditing and management accounting courses. The studies related to gender also produce conflicting results. Some studies indicate that male students perform better than female ones, but the results are either insignificant (for example, Lipe 1989) or only hold true for introductory courses (Doran, Bouillon and Smith 1991). To the contrary, Mutchler et al (1987) find that female students score significantly higher than male students. Furthermore, Gracia and Jenkins (2003) find that there is a significant difference in the performance in favor of female students over male students in Wales. In contrast, other studies find no significant differences in performance between male and female accounting students. For example, Tyson (1989) and Buckless et al (1991) demonstrate that gender effect disappears after controlling for general academic ability. Similarly, Gammie et al. (2003) find very little indication of performance differential between males and females throughout the degree program.

It is also possible that other intervening variables, besides the demographic variables, may affect student performance in accounting courses in college. Bartlett et al (1993) conclude that very few of the educational, demographic or financial characteristics variables appear to have a significant influence on student performance in university accounting examinations. Gracia and Jenkins (2003) observe that students who actively demonstrate commitment and self-responsibility towards their studies tend to do well in formal assessments. Accordingly, they agree with Bartlett et al. (1993) that intervening variables, rather than demographic variables, may be important determinants of student performance in university accounting examinations. They are also in agreement with Lane and Porch (2002) who suggest that other important factors like student motivation may explain student performance.

There is very limited, almost non-existent, literature on student performance in upper level finance classes. Dolvin and Pyles (2011) find that trading simulation performance in an Investments class has no significant impact on knowledge level and interest in the discipline or the investment profession. Huffman (2011) finds that the real estate major status is associated with higher grade performance in an advanced real-estate course.

Conflicting results are also observed about the association between student performance in introductory accounting and their performance in non-introductory accounting courses. For example, Canlar (1986) finds evidence that college-level exposure to accounting is positively related to student performance in the first MBA-level financial accounting course. Additionally, Tickell and Smyrnios (2005) find that the best predictor of academic performance in any one year is the performance in the

same discipline in the previous year. Doran et al (1991) report very surprising and counterintuitive result that performance in the introductory accounting course has a negative impact on performance in subsequent accounting courses. Maksy and Zheng (2008) and Maksy and Wagaman (2012, 2013, and 2015) find that OGPA and the grade in intermediate accounting II are strong predictors of student performance in advanced accounting, auditing, and senior seminar in accounting courses.

While prior research has been largely inconclusive or replete with conflicting results, it is not our purpose in this study to resolve all these conflicts. Our hope, in this study, is to provide more insight on those areas in which there was some general agreement. Since motivation and effort has generally been positively associated with student performance, we study whether some new selected motivation and effort factors affect student performance in the Investment Portfolio Management course. We also look at several factors which are commonly viewed as possibly distracting students from performing well and test whether they indeed are negatively affecting student performance. Moreover, we investigate the impact of two specific measures of prior abilities on student performance, and also use them as control variables while testing for the association between motivation and distraction factors and student performance in the Investment Portfolio Management course.

STUDY OBJECTIVES

The *first objective* of this research is to study the association between three selected motivation factors (the grade the student would like to make in the course, the student's intention to take the CFA or the CFP examination, and the student's intention to attend graduate school), and the student's performance in the Investment Portfolio Management course at a public residential school.

The *second objective* is to study the association between three variables representing "effort" and student performance. If the students are really motivated, they should spend more time studying for the course, do well in homework assignments, and participate in class discussions. Our study also investigates the possible associations between these effort variables and motivation factors.

The *third objective* is to study the association between three distraction factors (the student's number of working hours per week during the semester, the student's number of courses taken in the semester, and the student's job type, i.e., whether it is finance, accounting, or business related or not) and the student's performance in the Investment Portfolio Management course. Intuitively, the higher the number of work hours per week, the less time the student will have to study for the Investment Portfolio Management course resulting in lower course grade. Furthermore, it is likely that the performance of a student taking higher number of courses will be affected negatively because the student may not be able to devote sufficient number of hours of study to the course. Additionally, if the student's job is not related to finance, accounting, or business in general, the student's grade in the Investment Portfolio Management course will be lower than if the student's job is related to one of these areas. In light of the prior discussion, we hypothesize that if the student's number of work hours per week is higher, and/or the number of courses taken in the semester is higher, and/or the student's job is not related to finance, accounting, or business in general, there will be a significant *negative* association between these distraction factors and the student's performance in the Investment Portfolio Management course. Of course, distraction factors may offset each other thereby cancelling out any single factor's effect. For example, a student who works higher number of hours per week may take fewer courses, and vice versa, so that there is no negative effect on performance. For this reason, we test the effect of each distraction factor on student performance while controlling for the other two factors. We also investigate the associations among the distraction factors themselves and with the three effort factors.

The *fourth objective* is to study the association between students' performance in the Investment Portfolio Management course and their grade in the Investments course (which is a pre-requisite for the course), their overall GPA, and their self-reported abilities in math, writing, reading, and listening. A positive association between self-reported abilities and performance may indicate that students make reasonably accurate assessment of their abilities. A lack of positive and significant association between certain abilities and performance could be due to the possibility that those abilities are not relevant to the

performance in the course or to students' inaccurate assessment of their abilities. Before the students filled out the questionnaires, we instructed them to be as honest as possible in their answers so students who plan to take this course in the future would benefit from the results of this research. We assume that the students followed our instructions and, thus, we expect positive associations between students' self-perceived abilities and their performance in the Investment Portfolio Management course.

To compare our study with previous studies we also study whether performance in the Investment Portfolio Management course differs between gender and age groups.

STUDY VARIABLES

We initially used only the letter grade in the course (A=4, B=3, etc.) as the student performance dependent variable. However, we quickly realized that the letter grade treats a student earning the lowest end of the grade range as having the same exact performance as that of a student earning the highest end of the grade range. For example, a student with a total percentage points of 80 and another with a total percentage points of 89 would be considered having equal performance since both students receive a B for the course, even though the first student is one percentage point away from a C grade and the other student is one percentage point away from an A grade. As a result, we also decided to use overall points percentage earned by a student in the course as a dependent variable. Overall points percent score is a weighted average of scores in three tests (78%), homework (17%) and class participation (5%). Because we use homework and class participation scores as independent variables, we also use the percentage points the student earned in in-class tests as a third dependent variable to define student performance. This way, we are able to determine whether homework and class participation scores truly have any positive effects on student performance.

In addition to the three dependent variables above, we use 13 independent variables for the regression analysis. We also use eight different classification variables for differences in means test, and16 different variables for one-way analysis of variance and Pearson and Spearman's correlations. A list of these variables is presented below starting with the abbreviation used for each variable in the statistical models and ending with a definition or an explanation of the variable. We also explain why we combined some variables and why we did not use some variables in the analysis. The possible responses for each question (on the survey instrument) representing an independent variable are listed in brackets "[ ]".

Dependent Variables

1. *Letter Grade:* The letter grade, A, B, C, D, or F, the student earned for the course. The grades are converted into 4, 3, 2, 1, and 0 points respectively.
2. *Overall Points %:* The total number of percentage points calculated by giving 60% weight to three tests, 15% weight to homework based on online homework done on Connect by McGraw-Hill, 20% weight to online portfolio simulation using StockTrak plus a written report and presentation in class, and 5% weight to students' class participation.
3. *In-Class Test Score %:* Percentage points the student earned in three tests given in class. The tests are non-cumulative with 40% weight to two problems and 60% weight to 30 multiple choice questions and up to 10% extra credit for multiple choice questions based on *The Wall Street Journal* quizzes.

Independent Variables

1. *GradeMake:* The grade I would like to make in the course is [a. an A; b. at least a B c. at least a C; d. a D is fine with me]. For analysis purpose we use A= 4, B = 3, C=2, and D=1.
2. *CFA/CFP:* Are you planning to take the Chartered Financial Analyst (CFA) or Certified Financial Planner (CFP) exam? [a. Yes; b. No; c. Maybe]. For analysis purpose we use Yes = 2, No = 0, Maybe = 1. For the difference in means tests, we combined "No" and "Maybe" into one category to make it a binary variable.

3. *GradSch:* Are you planning to attend graduate school? [a. Yes, at this school; b. Yes, but at another school; c. No; d. Maybe]. For the difference in means tests, we combined "Yes at this school," with "Yes, but at another school," as one category, and we combined "No," with "Maybe," as one category to make it a binary variable. It should be noted that the course instructor often discourages students from going to graduate school right after finishing the undergraduate degree. He also discourages students from going to graduate school at their current university so that they can get more diverse educational experience.
4. *CStdyHrs:* In an average week, how many hours do you study for this course? [____hours].
5. *HWork:* Percentage points earned by a student on homework assignments.
6. *CPartcip:* Percentage points earned by the student for class participation.
7. *JHours:* In an average week, how many hours do you work at a job outside of school? [____ hours].
8. *JType:* My job outside of school is [a. Finance related; b. Accounting related; c. Business related (but not finance or accounting); d. Other]. For the difference in means tests, we combined first three answers as one category to make it a binary variable.
9. *CLoad:* How many courses are you taking this semester? [____ courses].
10. *Write:* My writing ability is [a. Very good; b. Good; c. Average; d. Poor]. For this variable and the three variables below we used codes from 4 for Very Good to 1 for Poor. Also, we scrambled the order of very good to poor on the survey instrument to diminish the possibility of students marking off the same letter in all four variables. Moreover, we put math in the middle to reduce the possibility of students marking writing, reading, and listening abilities the same.
11. *Math:* My math ability is [a. Poor; b. Average; c. Good; d. Very Good].
12. *Read:* My reading ability is [a. Poor; b. Average; c. Good; d. Very Good].
13. *Listen:* My listening ability is [a. Very good; b. Good; c. Average; d. Poor].
14. *AvgWRL:* Due to high and significant correlation between Write, Read, and Listen we calculated the average of the three variables and named it *AvgWRL.* It serves as useful proxy for the three variables and eliminates the multicollinearity problem. We use this variable (instead of Write, Read, and Listen) in the regression analyses.
15. *FIN354:* What was your grade for FIN 354 (Investments)? [__ A; ___ B; ____C; ___D]. We verified the grades with data provided by the University IRO. While student reported numbers were quite accurate, we used the data provided by the University IRO. As discussed above, we used grade points of 4, 3, 2, 1 for A, B, C, and D respectively.
16. *OGPA:* What is your Overall GPA? [___].

Categorization of Independent Variables

We classify variables 1, 2, and 3 as motivation factors; variables 4, 5, and 6 as effort factors; variables 7, 8, and 9 as distraction factors; and variables 10 to 14 as self-perceived ability factors. We do not include variables 10, 12 and 13 in the regression analyses for the reasons provided above. Variables 15 and 16 represent prior actual ability and are included for control purposes and also to determine whether they are associated with student performance.

STUDY HYPOTHESES

The study tests one hypothesis for each independent variable, for a total of 16 hypotheses. To prevent redundancy, all hypotheses are presented in the alternate form only. Below we provide formal statements for these hypotheses grouped under broad categories of factors:

Motivation Factors

Independent variable number one is GradeMake**.** Our hypothesis is that students who would like to make higher grades are motivated to perform well and do perform well in the course:

H_1: *There is a significant positive association between the grade the student would like to make in the Investment Portfolio Management course and student performance in the course.*

Independent variable number two is whether the student intends to take the CFA or the CFP exam. Our hypothesis is that students who intend to take either of these exams are more motivated to work hard to learn the material (to increase their chances of passing those exams) and this leads them to earning higher grade in the course.

H_2: *There is a significant positive association between the student's intention to take the CFA or the CFP Exam and student performance in the Investment Portfolio Management course.*

Independent variable number three under the motivation category is whether the student intends to attend graduate school. Our hypothesis is that students who have that intention are more motivated to study hard to increase their chances of getting accepted at a good graduate school, thus they end up earning higher grade in the course.

H_3: *There is a significant positive association between the student's intention to attend graduate school and student performance in the Investment Portfolio Management course.*

Effort Factors

A student who is motivated (because of any or all of the three motivation factors discussed above) to earn a higher grade in the Investment Portfolio Management course will participate in class discussions, perform well in all assigned homework, and spend more hours per week to study for the course. Thus, our next three hypotheses state that there are significant associations between these three effort variables and student performance. Because homework and class participation scores are used in determining the letter grade for the course and included in the overall points percentage for the semester, it is mathematically expected that there will be significant association between homework and class participation grades and students' letter grade point and overall points percentage score. The third dependent variable, in-class tests score, does not include homework and class participation grades, and avoids this problem. The formal hypotheses are stated below:

H_4: *There is a significant positive association between the student's class participation grade and student performance in the Investment Portfolio Management course.*

H_5: *There is a significant positive association between the student's homework score and student performance in the Investment Portfolio Management course.*

H_6: *There is a significant positive association between the number of study hours for the Investment Portfolio Management course and student performance in that course.*

Distraction Factors

Independent variable number seven of the study is the average number of hours per week the student works at a job outside of school. Our hypothesis is that students who work more hours may spend less time studying and doing homework and may attend fewer classes. As a result they may earn lower grades than students who work fewer hours or those who do not work at all.

H_7: *There is a significant negative association between the student's average number of hours of work per week and student performance in the Investment Portfolio Management course.*

Independent variable number eight is the student's job type. Our hypothesis is that students whose job is not related to finance, investment, accounting, or business in general will earn lower grades in the

Investment Portfolio Management course than students whose job is related to one of these areas. This is based on the assumption that the practical experience gained from the job will help students understand the course material better and thus earn high test scores and grades.

H_8: *There is a significant positive association between the student's job type (if it ist related to finance, investment, accounting, or business in general) and student performance in the Investment Portfolio Management course.*

Independent variable number nine is the number of semester courses a student is taking. Our hypothesis is that students who are taking more courses may spend less time studying per course and, therefore, will earn lower grades than students who take fewer courses.

H_9: *There is a significant negative association between the number of semester courses a student is taking and that student's performance in the Investment Portfolio Management course.*

Self-perceived Ability Factors

Independent variables numbers 10 to 13 represent students' self-perceived math, writing, reading, and listening abilities, and independent variable number 14 represents the average of writing, reading, and listening abilities combined. Our hypotheses are that students who perceive their abilities to be higher in these areas earn higher grades in the Investment Portfolio Management course. If students make accurate estimates of their abilities in these areas and if these abilities affect the performance in the Investment Portfolio Management course, there should be significant positive association between these estimates and student performance. Our hypotheses are stated as follows:

H_{10}: *There is a significant positive association between the student's self-reported math ability and student performance in the Investment Portfolio Management course.*

H_{11}: *There is a significant positive association between the student's self-reported writing ability and student performance in the Investment Portfolio Management course.*

H_{12}: *There is a significant positive association between the student's self-reported reading ability and student performance in the Investment Portfolio Management course.*

H_{13}: *There is a significant positive association between the student's self-reported listening ability and student performance in the Investment Portfolio Management course.*

H_{14}: *There is a significant positive association between the student's self-reported writing, reading, and listening abilities combined and student performance in the Investment Portfolio Management course.*

Prior Ability Factors

Independent variable number 15 of the study is the student's grade in FIN354 (Investments). Our hypothesis is that students who earned higher grades in FIN354, which is a prerequisite for the Investment Portfolio Management course, will earn higher grades in the latter course.

H_{15}: *There is a significant positive association between the grade the student earned in Investments course and student performance in the Investment Portfolio Management course.*

Independent variable number 16 of the study is the student's overall GPA (OGPA). Most prior research shows significant association between GPA and student performance. We believe this will be the case in this study as well. So, our hypothesis is that students with higher overall GPAs will earn higher grades in the Investment Portfolio Management course.

H_{16}: *There is a significant positive association between the student's overall GPA and student performance in the Investment Portfolio Management course.*

RESEARCH METHODOLOGY

Survey Instrument

We modified a list of survey questions, from Ingram et al. (2002), to include, besides the study variables, some demographic and other information. For ethical, confidentiality, and potential risk issues pertaining to participants, the authors had to submit a comprehensive 10-page application (together with a copy of the survey instrument) to the University's Institutional Review Board (IRB) for approval. Prior to that, both authors had to take the National Institute of Health (NIH)'s training course titled "Protecting Human Research Participants," and pass the test given at the end of the course. The certificates of completion of the course were required to be submitted with the application to the University's IRB. The University's IRB made only one modification to the survey instrument by adding the statement that "participation in the survey is completely voluntary."

Study Sample

In fall 2011, we were able to collect the data on the survey instrument from 39 of 44 students enrolled in the two sections of the undergraduate Investment Portfolio Management course offered at a public residential school. Only two sections of the Investment Portfolio Management course were offered and both sections were taught by the same instructor, so instructor effect is not an issue in this study. The university enrolls about 10,000 students, and the College of Business enrolls about 1,600 students. It is a state-owned university that has public access as a major part of its mission statement. It is located near some of the largest cities in the United States. It is one and a half hour drive from Philadelphia and two-hour drive from New York City. The instructor teaching the course provided us (using only students' ID numbers for confidentiality purposes) with the data representing the three dependent variables (the "letter grade," "overall points," and "in-class tests scores") and two independent variables (homework, and class participation percentage points.)

Table 1 presents descriptive statistics of the sample variables. Two different graduate students entered the data from student questionnaire on two separate Excel spreadsheets. The authors matched the two spread sheets and resolved any discrepancy by referring to original questionnaire. This virtually eliminated any data entry errors.

Data Analysis

To test the formulated hypotheses, we use the univariate one-way analysis of variance (ANOVA) test, and the multivariate ordinary least square linear regression test. Because the ANOVA test does not show the direction of the association (whether it is positive or negative) and also as a robustness test, we use Pearson and Spearman's correlation coefficients.

STUDY RESULTS

Table 1 presents the minimum and maximum value, the mean, and the standard deviation for each of the 19 non-binary variables of the study. That Table shows an average grade in the course of 2.59 versus 2.41 in Investments course which is a pre-requisite for the Investment Portfolio Management course. However, the average grade is much lower than the overall GPA of 3.14, and average Grade Make of 3.51. In comparison, Didia and Hasnat (1998) study of performance determinants in a finance course report a Financial Management course GPA of only 1.85, GPA in a pre-requisite course of 2.71, and overall GPA of 2.61. It is interesting to note that the positive difference of 0.18 between the average course letter grade and the average pre-requisite course grade is smaller than the comparable negative difference of 0.86 reported by Didia and Hasnat (1998). Also, the difference of 0.55 between the average course letter grade and overall GPA is smaller than the comparable difference of 0.76 reported by Didia

and Hasnat. No comparable data is available in the literature for the difference between average actual grade point in the course and average Grade Make points.

Students' self-reported average study time for the course is 4.21 hours per week which is only about two-thirds the 6 hours per week recommended by the instructor both verbally and in the syllabus. In comparison, Didia and Hasnat (1998) report 3.91 hours per week of study time for financial management classes they studied. Students' self-reported average total study time for all courses (not reported in the tables of this study) is only 12.37 hours per week compared to the suggested 30 hours per week based on average of 5 semester course load and the recommended six hours per semester course study time. This is even lower than the average Business Majors study time of 13.14 hours for 2004 reported by Babcock and Marks (2011). If we were to add the average reported total study hours of 12.37 per week and the average job hours of 16.88 per week we get a total of 29.25 hours, which comes very close to the recommended study hours of 30 per week. Babcock and Marks (2011) show decline in studying hours by non-working students also. However, if instructors lower the course rigor to meet the needs of the majority of working students, non-working students will not find it necessary to study more to fulfill their academic objective of achieving higher grade. It appears that students' need to work is cutting into their recommended study hours.

Table 2 presents differences in means tests for selected variables. Table 2 shows male to female ratio in the class of 64% to 36% with males earning an average of 0.06 higher letter grade points percentage, equal overall points score percentage, and 0.3 lower in-class tests score percentage. The differences are statistically insignificant. The OLS regression (which is not shown here) also has positive but insignificant coefficient for the males over females. Didia and Hasnat (1998) find negative but insignificant coefficient for males. Two other studies find the role of gender in the finance course performance to be statistically significant, however they show opposite results. Sen et al. (1997) show significant negative coefficient for females, while Henebry and Diamond (1998) show significant positive difference in grade for females.

With regard to age, Table 2 shows that 28% of the students were above the age of 22 years earning an average of 0.25 lower letter grade points, 4.5 lower overall points percentage, and 4.5 lower in-class tests score percentage. All the results are statistically insignificant. This is opposite of Didia and Hasnat (1998) which finds positive and significant coefficient for the actual age variable in the OLS regression.

Table 2 also shows that 90% of the students taking the Investment Portfolio Management course were finance majors and averaged 0.60 higher letter grade points, 4.0 percentage higher overall points score, and 3.0 percentage point higher in-class tests score than other majors. All the results are statistically insignificant.

Table 2 also shows difference in means tests for some motivation and distraction factors of the study after we converted them into binary variables as follows: (1) students planning to take the CFA or the CFP exam versus those who said no or maybe combined, (2) students planning to attend graduate school versus those who said no or maybe combined, (3) students working 20 hours or more per week versus those working less than 20 hours per week, (4) students whose job is accounting or finance related versus those whose job is not accounting or finance related, and (5) students taking six or more courses per semester versus those taking fewer than six courses per semester. Table 2 shows that while, as expected, students planning to attend graduate school have better performance (measured in grades, points, or in-class tests scores) than other students, and students working 20 hours or more per week have worse performance (in all three measurements) than students working less than 20 hours, all the differences are statistically insignificant. Contrary to expectations, Table 2 shows that students planning to take the CFA or the CFP examination have worse performance (measured in grades, points, or in-class tests scores) than other students; students whose job is accounting or finance related have worse performance (in all three measurements) than students whose job is not accounting or finance related; and students taking fewer than six courses per semester have worse performance (in all three measurements) than students taking six or more courses per semester. However, all differences are statistically insignificant.

We now analyze the results of the study by the type of factors investigated (motivation, effort, distraction, self-perceived abilities, and prior ability) taking all observations into account.

Motivation Factors Associated with Student Performance

Of the three motivation variables discussed in H_1 to H_3, GradeMake is significantly associated with student performance (however defined) based on One-Way ANOVA, and Pearson and Spearman's Correlation Coefficients at 0.01 level of significance (Tables 3 and 4). Table 5 shows that after controlling for prior ability, as measured by the pre-requisite Investments Course FIN 354 grade and OGPA, GradeMake's significant correlation with student performance (however defined) totally disappears. This is true also even if we control for OGPA alone (we do not report in the paper this additional partial correlation test.) One explanation of this is that, because this is an advanced and difficult course, students who have high GPA report that they would like make a higher grade and vice versa. Table 6, which reports the OLS regression coefficients using all study variables also shows that Grade Make is not significantly associated with student performance (however defined) but OGPA is significantly associated with student performance (at the 0.05 level when performance is measured as Overall Points or In-Class Tests and at the 0.10 level when performance is measured as the Letter Grade.) The other two motivation variables (intention to take the CFA or the CFP exam and intention to attend graduate school) are not significantly associated (under any test) with student performance (however defined.)

Because the results about GradeMake not significantly associated with student performance (under the partial correlation test and the multivariate regression test) are inconsistent with the results reported by Paulsen and Gentry (1995), Wooten (1998), Maksy and Zeng (2008), Gupta and Maksy (2014), and others, we decided to regress student performance on the three motivation variables alone (Table 7), on the three effort variables alone (Table 8) and on the motivation and effort variables together (Table 9). When we run the regression analysis using the motivation variables alone, GradeMake is significantly associated with student performance (at the 0.01 level when performance is measured by the Letter Grade or In-Class Tests, and at the 0.05 level when performance is measured by the Overall Points). As Table 9 shows, these results stay the same when we run the regression analysis using motivation and effort variables together (except that the significance level drops to 0.05 when performance is measured using the Letter Grade). Both Tables 7 and 9 still show that the other two motivation variables (intention to take the CFA or the CFP exam and intention to attend graduate school) are not significantly associated with student performance (however defined.)

Effort Factors Associated with Student Performance

As Table 3 indicates, according to the ANOVA tests, students' class participation has no significant association with student performance defined as "letter grade," has significant association (at the 0.01 level) with student performance defined as "total points," and has significant association (at the 0.10 level) with student performance defined as "in-class tests." However, as Table 4 indicates, both Pearson and Spearman correlations show significant associations (at the 0.01 level) between class participation and student performance (however defined). This is consistent with Rich (2006). However, once we control for the prior ability factors (FIN 354 grade and OGPA) that significant association totally disappears. Also, the OLS regression test does not show any association between class participation and student performance (however defined). When we run the OLS regression using only the effort factors (Table 8) we find significant association between class participation and student performance defined as the Letter Grade or Overall Points (at the 0.01 level) and between class participation and student performance defined as In-Class tests (at the 0.05 level). Running the OLS regression using the effort and motivation factors together (Table 9), we find significant association between class participation and student performance (however defined) but only at the 0.05 level.

Student performance on homework assignments has significant association (at the 0.01 level) with student performance, defined as the Letter Grade or Overall Points, under all tests including the partial correlation test that controls for prior ability factors (See Tables 3-6, 8 and 9). The only exception to this statement is that when student performance is defined as the Letter Grade, the significance of its association with homework is at the 0.05 level under the ANOVA test. These results are consistent with Wooten (1998). When student performance is measured by In-class tests there is no significant

association with homework assignments under the ANOVA test (Table 3) or the full regression test (Table 6) but there is a significant association (at the 0.01 level) under Pearson and Spearman Correlations (Table 4). However, after controlling for the prior ability factors, the significant association between performance in homework assignments and In-Class tests disappears (Table 5). Running the OLS regression using only the effort factors (Table 8) or the effort and motivation factors together (Table 9), we find significant association between homework and In-Class Tests at the 0.05 level.

The third effort variable, the number of study hours for the course (CHours), is statistically insignificant in explaining student performance (however defined) according to all tests.

Distraction Factors Associated with Student Performance

None of the three distraction factors has any significant association with student performance (however defined) under any tests. The ANOVA test (Table 3) showed one minor exception that there is some significant association, but only at the 0.10 level, between Job Type and student performance defined as Letter Grade. Since no other tests showed any association whatsoever between distraction factors and student performance, it is likely that this minor exception is a statistical anomaly.

Table 13, Part A, indicates that each distraction factor has no significant *negative* effect on student performance (however defined) even when we control for the other two distraction factors. Table 13, Part B, indicates that controlling for the other two distraction factors as well as the two prior actual ability variables (FIN354 and OGPA), the results remain the same. These results are consistent with the results reported by Maksy and Zheng (2008), Maksy (2012 and 2014), Gupta and Maksy (2014), and Maksy and Wagaman (2012, 2013, and 2015).

Self-perceived Abilities Factors Associated with Student Performance

None of the self-perceived ability factors has any association with student performance (however defined) under any tests. The Partial correlation test (Table 5) showed one minor exception that, when we control for the prior ability factors, there is some significant association, at the 0.05 level, between Average of Writing, Reading, and Listening and student performance defined as In-class tests. Since no other tests showed any association whatsoever between self-perceived ability factors and student performance, it is likely that this minor exception is a statistical anomaly as well. These results are not in agreement with Grover et al. (2010) and Didia and Hasnat (1998) but mostly consistent with the results reported by Maksy and Zheng (2008), Maksy (2012 and 2014), Gupta and Maksy (2014), and Maksy and Wagaman (2012, 2013, and 2015).

Prior Actual Ability (Control) Factors Associated with Student Performance

The ANOVA and Pearson and Spearman correlation tests show significant association (at the 0.01 level) between the FIN 354 course grade and student performance (however defined). However, all the OLS regression tests do not show any significant association between FIN 354 grade and student performance (however defined).

The Pearson and Spearman correlation tests show significant association (at the 0.01 level) between the OGPA grade and student performance (however defined). The OLS full regression test also shows significant association between OGPA and student performance but only at the 0.05 level when performance is defined as total points or In-class tests and only at the 0.10 level when performance is defined as the letter grade. However, the ANOVA test does not show any significant association between OGPA and student performance (however defined).

It is possible that the reason the OLS regression test does not show significant association between FIN 354 grade and student performance but shows significant association between OGPA and student performances is that the OLS tests work better with the continuous variable OGPA but not with the discrete variable FIN 354 grade. The fact that the correlation tests show highly significant association between student performance and both the prior ability factors, and that the ANOVA test shows highly significant association with one prior ability factor and the OLS regression test shows significant association with the other prior ability factor is consistent with numerous studies mentioned in the

literature review. Also, these significant associations make our use of these two variables for control purposes an appropriate procedure.

Additional Regression Models

The regression models usually do not show significant associations when the number of independent variables is large. For example, while the ANOVA and correlation tests showed highly significant association between the grade the student would like to make and student performance (however defined), the regression model showed no such significant association at any level. This is probably the case because the ANOVA and correlation tests are univariate but the regression test is multivariate. As a result, we decided to run additional regression models taking each category of factors (motivation, effort, distraction, self-perceived ability, and prior ability) at a time. We also combined motivation and effort variables in one additional regression model. When we regressed the three motivation variables on student performance (Table 7) we found that the grade the student would like to make is significantly associated with student performance (at the 0.01 level when performance is defined as letter grade or in-class tests and at the 0.05 level when performance is defined as total points). These significant associations did not show when we regressed all 13 variables of the study on student performance (Table 6). Similarly, when we regressed the three effort variables on student performance (Table 8) we found that class participation is significantly associated with student performance (at the 0.01 level when performance is defined as letter grade or total points and at the 0.05 level when performance is defined as in-class tests). These significant associations did not show when we regressed all 13 variables of the study on student performance (Table 6). When we regressed motivation and effort variables together on student performance (Table 9), the significant associations between GradeMake and student performance and between class participation and student performance remained, albeit at slightly lower significance levels.

When we regressed separately the distraction factors on student performance (Table 10) and the self-perceived ability factors on student performance (Table 11), no significant associations were found just as when we regressed all 13 variables together on student performance (Table 6). When we regressed separately the prior ability factors on student performance (Table 12), the results were the same (no significant association with FIN 354 grade but significant association with OGPA) as when we regressed all 13 variables together on student performance (Table 6), except that the significant association between OGPA and student performance (however defined) strengthened from the 0.05 or 0.10 level to the 0.01 level.

CONCLUSIONS AND RECOMMENDATIONS

One general conclusion of the study is that while most prior studies showed that motivated students perform better than non-motivated students the same result is confirmed in this study but only under univariate tests such as ANOVA and Correlations. When we use multivariate tests that include other explanatory variables for student performance (such as Overall GPA) the motivation variables' explanatory power disappears in the Investment Portfolio Management course which is a difficult course taken by Finance majors during the last semester before graduation. However, Table 1 shows that there was quite a disparity between average GradeMake of 3.51 and average letter grade of only 2.59. However, speaking of motivation, all tests show that intention to take the CFA or the CFP examination and intention to attend graduate school do not seem, in this study, to be motivating factors for the students to perform well in the Investment Portfolio Management course.

In light of the above general conclusion, we recommend that finance faculty should know that encouraging their students to plan to take the CFA or the CFP exam or pursue graduate studies, while seems to be a good idea, it would probably not going to do the trick and motivate students to put the time and effort to study hard and to do well in the Investment portfolio management course. The finance faculty may want to think of other motivating factors.

Another logically and expected general conclusion of the study is that students who participate in class discussions and do well in their homework have better overall performance than students who do not

do so. All study tests provide strong to moderate evidence in support of this conclusion, particularly with regard to doing well in homework because the effect of class discussion on student performance disappears after controlling for prior ability factors (FIN 354 grade and OGPA) or when we use multivariate tests that include other variables (such as OGPA) that have more explanatory power of student performance than class participation. On the other hand, all tests show that the number of hours of study for the course is not significantly associated with student performance. This unexpected result could be due to the possibility that all students (regardless of their performance) over-estimate the number of hours they study for the course.

In light of the above discussion regarding Homework Grades, Class Participation, and Course Study Hours, we can conclude that there is direct significant association between effort and course performance based on all four statistical tests. In addition, we find strong association between two effort factors (Homework Grades and Class Participation) and the prior ability factors (FIN 354 Grade and OGPA). We also find strong significant correlation between GradeMake and OGPA and also the grade in FIN 354 at the 0.01 level of significance. One possible explanation for all this is that students with prior ability are highly motivated to achieve higher grades and put effort reflected in Homework Grades and Class Participation. However, these students seem to over-estimate the number of study hours for the course which is reflected in statistically insignificant association between Course Study Hours and performance in the Course.

In light of the above discussions, we recommend that finance and accounting faculty inform their students that research shows that doing the homework and participating in class discussion do indeed improve students' grades.

An initial conclusion from the statistical tests of this study is that the distraction variables, i.e., number of hours of work per week, working in non-finance, accounting, or business related jobs, number of courses taken in the semester have no statistical significant negative associations with student performance. That is, they do not distract the students and prevent them from earning higher grades in the Investment Portfolio Management course. This is consistent with the results reported by Chan et al. (1997), Wooten (1998), Maksy and Zheng (2008), Maksy (2012 and 2014), Gupta and Maksy (2014), and Maksy and Wagaman (2012, 2013, and 2015).among others.

However, upon a closer look, Table 2 shows that 49% of the students (those who are working 20 hours or more per week) earned 0.51 less letter grade points, 4.0 less in overall points percentage, and 2.9 less in in-class tests percentage than students who are working less than 20 hours per week. While these numbers are not statistically significant, they cannot be completely ignored.

Moreover, Job Hours show significant negative Pearson correlation with Homework Grade, and significant negative Pearson and Spearman correlations with Course Load (Table 4). These results are consistent with Paisey and Paisey (2004) and Lynn and Robinson- Backmon (2005). The first two of these may have negative consequences for learning outcomes not reflected in course in-class tests, overall points, or letter grade. The last one could delay graduation.

Surprisingly, 44% of the students (those taking 6 or more courses in the semester) earned 0.50 higher letter grade points, 2.3 higher overall points percentage, and 3.1 more in-class tests percentage (Table 2). However, none of those is statistically significant.

In light of these conclusions we recommend that students be encouraged to work fewer than 20 hours per week so that they can earn better grades and graduate sooner.

A fourth general conclusion of the study is that students' estimate of their own math and average of their writing, reading and listening abilities have no significant association with students' performance in the Investment Portfolio Management course. This is an indication of the possibility that students are providing inaccurate evaluation of their own abilities in these areas. The students' inability to accurately evaluate their abilities can have negative consequences on their performance because they may not seek help in the areas they have weakness in.

In light of this general conclusion, we recommend that the college of business faculty in general, and finance faculty in particular, should encourage students to make more accurate evaluations of their math, writing, reading and listening abilities and to seek help for the areas they have some weakness in.

As expected and as shown in prior studies with respect to other courses, a fifth general conclusion of the study is that students with high prior actual ability end up earning high grades in the Investment Portfolio Management course. Specifically, the study provides strong evidence that students' performance in the pre-requisite Investments course (FIN354) and their OGPA are strong predictors of their performance in the Investment Portfolio Management course.

In light of this general conclusion, we recommend that accounting and finance faculty encourage their students to study hard and improve their GPA by emphasizing that research shows that students with high overall GPA continue to earn high grades in the Investment Portfolio Management course. Again, we realize that some faculty may already be doing this; thus, these recommendations are for those who may not be.

STUDY LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

This study is subject to some limitations. One limitation is that the study school is a public (or state-supported) university and, thus, the conclusions may not be applicable to private schools. One suggestion for further research is to replicate the study at a private school. Another limitation is that the study school is a residential school with most students enrolling in the Investment Portfolio Management course in their early 20s and it is possible that the results may not be generalizable to commuter schools with generally older students. Consequently, another suggestion for further research is to replicate the study at a commuter school with older students. A third limitation is that the study sample is somewhat small relative to the number of variables analyzed and, hence, the results may not be as robust as they would have been if the sample was larger. Thus, another suggestion for further research is to replicate the study using a somewhat larger sample by collecting data over a number of years if the class size is small.

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APPENDICES

TABLE 1
DESCRIPTIVE STATISTICS FOR THE STUDY NON-BINARY VARIABLES

	N	Minimum	Maximum	Mean	Std. Deviation2
Letter Grade[1]	39	0	4	2.59	.97
Overall Points (in %)	39	55	99	79.87	9.47
In-Class Tests (in %)	39	54	98	76.72	10.86
Grade Make[1]	39	2	4	3.51	0.60
CFA/CFP[2]	39	0	2	1.08	0.70
Grad School[3]	39	0	3	1.41	1.02
Home Work (in %)	39	31	100	89.90	16.78
Class Participation (in %)	39	24	88	55.33	14.59
Course Study Hours	39	1	15	4.21	2.69
Job Hours	37	0	50	16.88	10.95
Job Type[4]	35	1	4	1.97	1.04
Number of Courses	39	3	7	5.36	.99
Math Ability[5]	39	2	4	3.31	0.61
Writing Ability[5]	39	1	4	3.08	0.62
Reading Ability[5]	39	1	4	3.18	0.79
Listening Ability[5]	39	2	4	3.13	0.70
Average of Write/Read/Listen	39	2	4	3.13	0.52
FIN 354 Grade[1]	39	1	4	2.41	0.94
OGPA (out of 4.0)	39	2.35	3.97	3.14	0.42

[1]A = 4.00; B = 3.00; C = 2.00; D = 1.00; F = 0.00.
[2]No = 0; Maybe = 1; Yes = 2
[3]No = 0; Maybe = 1; Yes, at this school = 2; Yes, at another school = 3
[4]Other = 1; Business Related (but not accounting or finance) = 2; Finance related = 3; Accounting related = 4
[5]Very Good =4; Good =3; Average =2; Poor =1

TABLE 2
DIFFERENCES IN MEANS TESTS FOR SELECTED VARIABLES

Variable	Category	Number (%)	Mean Letter Grade	Mean Overall Points %	Mean In-ClassTests %
Gender	Male	25 (64)	2.56	79.9	76.6
	Female	14 (36)	2.50	79.9	76.9
	Male - Female		0.06	0.0	-0.3
	P-Value		0.848	0.994	0.925
Age	Above 22	11[1] (28)	2.36	76.6	73.5
	18-22	28 (72)	2.61	81.1	78.0
	Difference		-0.25	-4.5	-4.5
	P-Value		0.477	0.192	0.260
Primary Major	Finance	35 (90)	2.60	80.3	77.0
	Other	4 (10)	2.00	76.3	74.0
	Finance - Other		0.60	4.0	3.0
	P- Value		0.244	0.517	0.543
CFA/CFP	Yes	11[2] (28)	2.46	79.5	75.4
	No/Maybe	28 (72)	2.57	80.0	77.3
	Yes – No/Maybe		-0.11	-0.5	-1.9
	P-Value		0.734	0.865	0.642
Grad School	Yes	11 (28)	2.64	80.8	79.4
	No/Maybe	28 (72)	2.50	79.5	75.7
	Yes – No/Maybe		0.14	1.30	3.7
	P-Value		0.709	0.693	0.282
Job Hours	20 hours or more	18 (49)	2.28	77.7	75.1
	Less than 20 hours	19 (51)	2.79	81.7	78.0
	Difference		-0.51	-4.0	-2.9
	P-Value		0.118	0.222	0.414
Job Type	Other	15 (43)	2.67	81.1	79.2
	Acc-Fin-Bus Rel.	20 (57)	2.45	78.9	75.1
	Difference		0.22	2.2	4.1
	P-Value		0.526	0.508	0.291
Course Load	6 or more courses	17 (44)	2.82	81.2	78.5
	Fewer than 6 courses	22 (56)	2.32	78.9	75.4
	Difference		0.50	2.3	3.1
	P-Value		0.108	0.458	0.390

[1]Only 3 students indicated preference for CFA/CFP and 4 for graduate school, including 1 for both CFA and graduate school.
[2]Only 2 students indicated preference for both CFA/CFP and graduate school. So CFA/CFP and graduate school preference samples are not identical.

TABLE 3
ONE-WAY ANALYSIS OF VARIANCE
(All numbers are for Between Groups Only)

		Dependent Variables					
		Letter Grade		**Overall Points %**		**In-Class Tests %**	
Indep. Var.	**DF**	**F**	**Sig.**	**F**	**Sig.**	**F**	**Sig.**
Grade Make	2/38	6.347	0.004***	6.799	0.003***	8..991	0.001***
CFA/CFP	2/38	0.071	0.932	0.014	0.986	0.185	0.832
Grad School	3/38	0.735	0.538	0.408	0.749	0.424	0.737
Class Participation	22/38	1.676	0.146	3.646	0.005***	2.059	0.071*
Home Work	16/38	2.274	0.037**	2.968	0.009***	1.118	0.396
Course Study Hours	12/38	0.185	0.998	0.134	0.999	0.201	0.997
Job Hours	15/36	0.682	0.774	0.453	0.940	0.549	0.882
Job Type	3/34	2.669	0.065*	1.568	0.217	1.668	0.194
Course Load	4/38	0.873	0.490	0.611	0.657	0.930	0.458
Math	2/36	0.738	0.485	1.045	0.362	1.471	0.243
Write	3/35	0.218	0.883	0.367	0.777	0.087	0.967
Read	3/35	0.104	0.957	0.234	0.872	0.052	0.984
Listen	3/35	1.587	0.210	0.868	0.467	1.744	0.176
AvWRL	6/38	0.932	0.486	1.159	0.352	1.556	0.192
FIN354	3/35	6.125	0.002***	7.101	0.001***	7.009	0.001***
OGPA	29/36	0.925	0.599	1.341	0.364	1.611	0.266

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 4
PEARSON\SPEARMAN CORRELATION COEFFICIENTS*

	LtrGrd	Points	Tests	Grd Mk	CFA/ CFP	Grd Sch	ClPrt	HW	CStdyH	JHours	JType	CLoad	Math	Write	Read	Lstn	AvWRL	FIN 354	OGPA
LtrGrd	**1**	.924[1]	.930[1]	.417[1]	-.146	.149	.589[1]	.593[1]	-.109	-.226	-.095	.076	-.048	.010	.065	.237	.142	.568[1]	.728[1]
Points	.939[1]	1	.934[1]	.405[1]	-.022	.120	.608[1]	.740[1]	-.095	-.214	-.006	.025	-.075	-.043	.088	.170	.103	.607[1]	.745[1]
Tests	.924[1]	.954[1]	1	.474[1]	-.101	.182	.554[1]	.498[1]	-.160	-.122	-.108	.037	-.089	.100	.169	.204	.215	.580[1]	.734[1]
GrdMk	.441[1]	.447[1]	533[1]	1	.153	.034	.238	.170	.015	.028	.071	.081	-.011	.103	.023	-.036	.037	.644[1]	.569[1]
CFA/CFP	-.164	-.117	-.107	.167	1	-.082	.051	.061	-.036	.009	.197	.111	.066	-.374[5]	-.120	-.128	-.267	.150	.041
GrdSch	.102	.129	.157	.086	-.006	1	.067	.066	.007	-.157	.065	.164	.130	.322[5]	.462[1]	.370[5]	.525[1]	.040	.302[10]
ClPrt	.490[1]	.490[1]	.478[5]	.250	.131	.071	1	.429[1]	-.318[5]	-.272	-.185	-.045	-.079	-.095	-.186	.058	-.106	.415[1]	.596[1]
HW	.630[1]	.716[1]	.553[1]	.206	-.086	.151	.468[1]	1	.051	-.397[5]	.147	-.025	-.091	-.268[10]	-.054	.087	-.096	.411[1]	.462[1]
CStdyH	-.073	-.080	-.199	-.094	-.108	.000	-.115	.063	1	.056	.451[1]	-.028	-.015	.053	-.111	.014	-.029	.127	-.126
JHours	-.218	-.212	-.138	.017	-.068	-.210	-.228	-.305[10]	.023	1	-.255	-.284[10]	-.228	.247	.000	.032	.116	-.106	-.213
JType	-.103	-.036	-.161	.052	.254	.064	-.230	.058	.352[5]	-.299[10]	1	.236	.059	-.218	.110	.006	-.029	.157	.018
CLoad	.115	.053	.036	.065	.060	.172	-.076	-.026	-.027	-.315[10]	.219	1	.204	-.174	.118	.353[5]	.147	.178	.198
Math	.016	.014	-.042	-.002	.044	.074	-.108	-.084	-.011	-.250	.109	.163	1	-.064	.100	.152	.093	.095	.017
Write	.053	.033	.148	.163	-.357[5]	.340[5]	-.120	-.289[10]	-.012	.165	-.212	-.120	.002	1	.398[5]	.098	.643[1]	-.100	.077
Read	.059	.117	.179	-.012	-.191	.454[1]	-.261	-.004	-.187	-.047	.070	.127	.080	.403[1]	1	.436[1]	.857[1]	-.173	.107
Lstn	.195	.157	.173	-.021	-.133	.377[5]	.020	.065	.034	.031	-.013	.337[5]	.144	.157	.442[1]	1	.703[1]	.079	.271
AvWRL	.118	.129	.208	.054	-.298[10]	.510[1]	-.172	-.076	-.056	.084	-.049	.151	.078	.668[1]	.844[1]	.705[1]	1	.092	.209
FIN 354	.567[1]	.613[1]	.572[1]	.653[1]	.142	.021	.357[5]	.437[1]	.140	-.060	.105	.153	.125	-.035	-.227	.044	-.104	1	.690[1]
OGPA	.701[1]	.714[1]	695[1]	.584[1]	-.006	.341[5]	.494[1]	.476[1]	-.144	-.264	-.040	.171	.083	.194	.115	.284[10]	.254	.617[1]	1

*Pearson correlations are above the diagonal and Spearmen correlations are below the diagonal.

[1]1% level of significance using two tails test.

[5]5% level of significance using two tails test.

[10]10% level of significance using two tails test.

TABLE 5
PEARSON PARTIAL CORRELATION COEFFICIENTS (CONTROLLING FOR FIN 354 AND OGPA)

	LtrGrd	Points	Tests	GrdMk	CFA/ CFP	Grd Sch	ClPrt	HW	CStdy H	JHours	JType	CLoad	Math	Write	Read	Lstn	AvWRL
LtrGrd	1																
Points	.853[1]	1															
Tests	.802[1]	.898[1]	1														
GrdMk	-.076	-.103	.004	1													
CFA/CFP	-.240	-.141	-.180	.114	1												
GrdSch	.113	.152	.146	-.098	-.171	1											
ClPrt	.172	.171	.030	-.287	.008	-.040	1										
HW	.494[1]	.613[1]	.286	-.186	-.082	.296	.129	1									
CStdyH	-.059	-.058	-.145	-.054	-.129	.117	-.422[5]	.058	1								
JHours	.012	.113	.234	.192	.147	-.128	.008	-.277	-.023	1							
JType	-.220	-.139	-.228	.038	.106	.089	-.317[10]	.056	.407[5]	-.209	1						
CLoad	.069	-.129	-.031	-.051	-.041	-.003	-.058	-.122	-.003	-.332[10]	.209	1					
Math	-.007	-.208	-.128	-.011	-.030	.131	-.147	-.195	.009	-.311[10]	.015	.119	1				
Write	.071	.063	.230	.198	-.376[5]	.272	-.143	-.183	.090	.179	-.184	-.201	-.089	1			
Read	.108	.174	.302	.223	-.188	.368[5]	-.401[5]	.023	.081	.218	.167	.004	.040	.465[1]	1		
Lstn	.396[5]	.323[10]	.280	-.236	-.255	.156	-.045	.331[10]	.052	.040	-.007	.296	.096	-.062	.418[5]	1	
AvWRL	.260	.258	.375[5]	.093	-.370[5]	.371[5]	-.283	.080	.102	.205	.002	.047	.024	.637[1]	.889[1]	.627[1]	1

[1]1% level of significance using two tails test.
[5]5% level of significance using two tails test.
[10]10% level of significance using two tails test.

TABLE 6
REGRESSION ANALYSIS: ALL STUDY VARIABLE AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables											
	Letter Grade				Overall Points %				In-Class Tests %			
	Coeff.	Sig.			Coeff.	Sig.			Coeff.	Sig.		
Constant	-6.048	0.004***			5.334	0.744			-3.673	0.873		
Grade Make	0.063	0.807			- 0.198	0.930			- 0.157	0.961		
CFA/CFP	-0.132	0.460			- 0.549	0.726			- 1.065	0.631		
Grad Sch	-0.086	0.512			- 0.525	0.650			- 0.045	0.978		
CParticip	0.008	0.550			0.046	0.676			- 0.042	0.788		
Home Work	0.032	0.006***			0.318	0.002***			0.219	0.104		
CStdyHrs	0.007	0.895			- 0.095	0.826			- 0.422	0.495		
JHours	0.016	0.290			0.169	0.220			0.239	0.221		
JType	-0.119	0.342			-0.378	0.728			-1.015	0.512		
CLoad	0.165	0.219			0.342	0.768			1.024	0.534		
Math	0.207	0.318			0.292	0.871			0.262	0.918		
AvWRL	0.204	0.485			2.081	0.421			3.228	0.378		
FIN354	0.148	0.448			1.312	0.448			2.986	0.227		
OGPA	0.866	0.090*			9.880	0.032**			12.857	0.047**		
Adj. R^2	0.664				0.712				0.591			
F	5.714	0.000***			6.902	0.000***			4.444	0.002***		

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 7
REGRESSION ANALYSIS: MOTIVATION FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables											
	Letter Grade				Overall Points %				In-Class Tests %			
	Coeff.	Sig.			Coeff.	Sig.			Coeff.	Sig.		
Constant	0.116	0.897			56.838	0.000***			45.830	0.000***		
Grade Make	0.694	0.008***			6.504	0.012**			8.919	0.002***		
CFA/CFP	-0.164	0.444			- 1.042	0.622			- 2.531	0.269		
Grad Sch	0.113	0.437			0.927	0.521			1.617	0.300		
Adj. R^2	0.136				0.111				0.216			
F	2.992	0.044**			2.575	0.069*			4.496	0.009***		

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 8
REGRESSION ANALYSIS: EFFORT FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables							
	Letter Grade			Overall Points %			In-Class Tests %	
	Coeff.	Sig.		Coeff.	Sig.		Coeff.	Sig.
Constant	-1.490	0.030**		37.539	0.000***		42.027	0.000***
CParticip	0.025	0.009***		0.227	0.006***		0.294	0.017**
Home Work	0.029	0.000***		0.333	0.000***		0.214	0.033**
CStdyHrs	0.003	0.947		- 0.048	0.901		- 0.208	0.720
Adj. R^2	0.522			0.621			0.340	
F	14.846	0.000***		21.756	0.000***		7.533	0.001***

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 9
REGRESSION ANALYSIS: MOTIVATION AND EFFORT FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

	Dependent Variables							
	Letter Grade			Overall Points %			In-Class Tests %	
Indep. Variables	Coeff.	Sig.		Coeff.	Sig.		Coeff.	Sig.
Constant	-2.591	0.002***		27.696	0.000***		25.205	0.015**
Grade Make	0.452	0.015**		3.990	0.015**		6.770	0.005***
CFA/CFP	-0.202	0.178		- 1.467	0.263		- 2.885	0.129
Grad Sch	0.066	0.516		0.424	0.633		1.213	0.345
CParticip	0.020	0.024**		0.188	0.017**		0.225	0.044**
Home Work	0.029	0.000***		0.327	0.000***		0. 203	0.026**
CStdyHrs	-0.008	0.841		- 0.142	0.694		- 0.376	0.472
Adj. R^2	0.584			0.665			0.473	
F	9.908	0.000***		13.579	0.000***		6.677	0.000***

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 10
REGRESSION ANALYSIS: DISTRACTION FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables: Letter Grade		Overall Points %		In-Class Tests %	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
Constant	2.235	0.100*	80.595	0.000***	70.093	0.000***
JHours	-0.024	0.211	- 0.204	0.289	-0.090	0.676
JType	-0.118	0.508	- 0.449	0.799	-1.326	0.508
CLoad	0.180	0.387	0.673	0.743	1.949	0.405
Adj. R^2	0.015		-0.041		-0.050	
F	1.172	0.337	0.562	0.644	0.473	0.703

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 11
REGRESSION ANALYSIS: SELF-PERCEIVED ABILITY FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables: Letter Grade		Overall Points %		In-Class Tests %	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
Constant	1.688	0.183	77.924	0.000***	68.491	0.000***
Math	0.018	0.947	- 1.309	0.612	- 1.951	0.502
AvWRL	0.253	0.416	2.006	0.509	4.693	0.173
Adj. R^2	-0.036		-0.037		0.006	
F	0.348	0.708	0.324	0.725	1.117	0.338

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 12
REGRESSION ANALYSIS: PRIOR ABILITY FACTORS AND STUDENT PERFORMANCE
(All numbers are for 39 Observations)

Indep. Variables	Dependent Variables							
	Letter Grade		Overall Points %			In-Class Tests %		
	Coeff.	Sig.		Coeff.	Sig.		Coeff.	Sig.
Constant	-2.254	0.016**		32.450	0.001***		20.517	0.060*
FIN354	0.189	0.244		1.374	0.382		1.760	0.360
OGPA	1.399	0.000***		14.238	0.000***		16.642	0.000***
Adj. R^2	0.545			0.539			0.523	
F	22.560	0.000***		22.068	0.000***		20.765	0.000***

*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test

TABLE 13
PARTIAL CORRELATION COEFFICIENTS OF SELECTED DISTRACTION FACTORS WITH STUDENT PERFORMANCE[a]

	Part A						***Part B***					
Dep. Var.	**Letter Grade**		**Overall Points %**		**In-Class Tests %**		**Dep. Var.**	**Letter Grade**		**Overall Points %**		**In-Class Tests %**	
Dist. Factor	***Coef.***	***Sig.***	***Coef.***	***Sig.***	***Coef.***	***Sig.***	**Dist. Factor**	***Coef.***	***Sig.***	***Coef.***	***Sig.***	***Coef.***	***Sig.***
JHours	-.227	.211	-.193	.289	-.077	.676	**JHours**	.001	.996	.059	.766	.211	.281
JType	-.122	.508	-.047	.799	-.121	.508	**JType**	-.238	.223	-.105	.594	-.198	.312
CLoad	.158	.387	.060	.743	.153	.405	**CLoad**	.116	.558	-.081	.683	.082	.679

a ***Part A:*** *While controlling for the other two distraction factors.*
Part B: *While controlling for the other two distraction factors as well as prior actual ability factors (FIN354 & OGPA).*
*Significant at 10% level of significance using two tails test
**Significant at 5% level of significance using two tails test
***Significant at 1% level of significance using two tails test