

Should personal finance be the first finance course?

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Abstract

We examine the effect that taking a college-level personal finance course has on students' performance in a concurrent or subsequent managerial finance course. Using institutional data for students in first time, full time cohorts for 2002–2006, we find that taking the finance courses concurrently appears to significantly increase the likelihood of earning a higher grade in or passing Financial Management, but that taking Personal Finance first does not. We conclude that taking the courses concurrently may be beneficial because it increases the time spent on complementary reading and homework, provides two perspectives on similar material, and increases focus on finance. © 2013 Academy of Financial Services. All rights reserved.

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1. Introduction

A recent US News and World Report article¹ ranked four finance-related jobs in the top 11 spots on their Best Business Jobs of 2013 list. Among the reasons for their high rankings is their above-average expected job growth rates for the next decade. According to Bureau of Labor Statistics (BLS) data cited in the article, financial advising jobs are expected to grow by about 32%, financial management jobs by about 9%, insurance and risk management jobs by about 22%, and financial analyst jobs by 23%. Together the BLS data suggest there will be openings for more than 350,000 new or replacement positions in finance-related jobs over the next 10 years. Data from the National Center for Education Statistics² indicates that about

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34,000 finance majors graduated in the 2009–2010 school year. If that is representative of the next 10 years, we will fall short of projected demand. To meet expected demand with a pool of well-trained finance graduates, business schools need to attract, retain and engage students in the major; a major that students tend to perceive as more difficult than others in business. The introductory financial management course that is typically required for business majors serves as a gateway to the major, either capturing students' attention and inviting them into the discipline or scaring them away. As finance faculty, we must consider ways to improve delivery of the financial management course to increase comprehension and student engagement to draw more students into the major and provide a talented pool of applicants for the large number of expected openings in financial services and corporate finance.

Krishnan, Bathala, Bhattacharya, and Ritchey (1999) surveyed students in three business schools at the beginning and end of their semester-long introductory managerial finance courses. Their sample included students majoring in all business disciplines and therefore required to take the course. Nearly 88% of respondents indicated the course was more difficult than other courses they had taken, and that they considered it highly quantitative. Written comments of many students indicated that they would like more time spent on basic quantitative tools as they are introduced. The authors specifically recommend three possible alternatives to improve the design and delivery of the introductory finance course: 1) a two course finance sequence similar to accounting; 2) a four credit hour course with one hour per week devoted to a finance lab; and 3) limit coverage to the more important and basic topics. In general, one could summarize their recommendations as, "Spend more time on each topic."

Vihtelic (1996) proposes a more specific approach. Concerned that students may find it difficult to relate to the corporate focus of the typical introductory finance course, she suggests that a personal finance course should precede Financial Management as the introduction to the finance curriculum. She argues that a more student-centered learning approach would help students relate the new material to their own experiences and improve their ability to recall and apply finance knowledge. Comparing topics covered in popular Financial Management and Personal Finance texts, she asserts that the only managerial topic without a corollary in Personal Finance is the weighted average cost of capital. Gold, Pryor, and Jagolinzer (2006) report that time value of money, financial planning process, personal financial statements, and mutual funds receive the most emphasis in for credit personal finance courses. All of these are relevant to corporate finance.

Taking a personal finance course before or with the managerial finance course could fulfill the recommendations from both articles. It could provide students with a personal connection to the material that Vihtelic suggests would create a more effective cognitive structure enabling deeper understanding and greater recall. It could also provide the additional time covering key finance topics that Krishnan, Bathala, Bhattacharya, and Ritchey (1999) advocate. In our study, we test the hypotheses that taking a college-level personal finance course either before or at the same time as the managerial course improves students' grades and likelihood of passing in the introductory managerial finance course that is required of all business majors. We have institutional data for all students in the first time, full time³ cohorts from 2002 to 2006. Data includes cumulative college grade point average (GPA) per semester, SAT scores, major, age at matriculation, sex, race, whether and when they took the

university's personal finance course, when they took the managerial finance course, whether and when they graduated, and final grades in the two finance courses.

Consistent with previous literature, we find that mathematics SAT scores, GPA, and college major are significant determinants of grades in the managerial finance course. Though we find no evidence that taking the personal finance course first significantly affects grades or passing rates, we find consistent evidence that taking the two finance courses concurrently does. In ordinal regressions on Financial Management grades, using our full sample, a reduced sample of only students who took Personal Finance at some point before graduating, and another reduced sample of only business majors, we observe that taking the courses concurrently has a significantly positive association with grades. In full sample *t* tests, we find that taking the courses concurrently appears to increase average grades by 15%. Likewise, in logistic regressions, we see that it also has a significantly positive effect on the likelihood that a student will pass Financial Management. For example, in our full sample and among students with relatively low GPAs and math SAT scores, the odds of passing Financial Management appear to be 2.5 times higher for those who take the courses concurrently than for those who do not.

Though our results could be used to advocate that Financial Management students be advised to take Personal Finance concurrently, there are at least three reasons to proceed cautiously. First, while our univariate and multivariate analyses provide strong evidence of an association between higher grades and passing rates and taking the courses concurrently, they do not prove causality. Second, in addition to possible resource constraints, doing so may reduce the effectiveness of the Personal Finance course with respect to its objectives. Many students currently take Personal Finance as freshmen or sophomores, when instructors might have the best chance of helping students avoid costly financial mistakes common to college students, like accruing large amounts of student loan or credit card debt. In contrast, taking the finance courses concurrently implies students would be juniors or seniors, which could be too late. Third, we do not examine whether Personal Finance is the only finance course that might improve Financial Management grades when taken concurrently. We believe that the beneficial effect we document probably results from increased time listening to complementary lectures and doing complementary readings and homework problems, as well as, perhaps, the increased focus that comes of having finance for two of five courses instead of only one. Other finance courses that do not need to be taken in a specific sequence with Financial Management, such as a financial markets or institutions course, could have a similar effect. We leave the investigation of these caveats to future research.

2. Literature review

The literature has provided mixed results regarding the benefits of instruction in personal finance. Among those who find positive effects on either knowledge or behavior are Garman, Kim, Kratzer, and Brunson (1999), Tennyson and Nguyen (2001), Bernheim, Garrett, and Maki (2001), Fox, Bartholomae, and Lee (2005), and Walstad, Rebeck and MacDonald (2010). Those who found no significant impact on behavior include Mandell (2006), Mandell and Klein (2009), and Robb and Sharpe (2009). Xiao, Serido, and Shim (2010) find that first

year college students who report taking a personal finance course in high school or college report greater subjective knowledge but do not exhibit greater objective knowledge or less risky paying or borrowing behaviors than those that report not taking a personal finance course. Mandell and Klein (2007) reported that student motivation was an important mitigating factor in increasing the financial literacy of respondents, indicating that motivated adults benefit from targeted financial education.

We know of no previous work that investigates the impact of taking a personal finance course on outcomes in other finance courses. The literature investigating other possible determinants of success in the introductory managerial finance course is in agreement that math skills are important, but show mixed results with respect to other determinants. Didia and Hasnat (1998) studied the performance of 210 students enrolled in the introductory financial management course. They found that the student's highest college level math grade, cumulative GPA, grades in prerequisite Accounting and Economics courses, semester course load and age were all positively related to the student's final grade in the course. Gender and transfer student status had no effect and hours spent studying was negatively but weakly related to the grade.

Similarly, Pritchard, Romeo, and Saccucci (2000) studied 117 students enrolled in the introductory financial management course. They found that algebra skills, measured using the computational skills and algebra portions of the New Jersey College Basic Skills Placement Test, were the most significant determinant of the final grade in the course. They also found that females and older students did significantly better, while transfer students, nonfinance majors, commuters, and non-native English speakers performed no differently than others and that hours worked during the semester had no effect.

Alcock, Cockcroft, and Finn (2008) examined records of 1370 students enrolled in a bachelor of commerce degree program between 2003 and 2006. They found that having passed Maths B in high school significantly increased pass rates and grades in introductory finance, but having passed the economics and accounting in high school had no effect. Maths B includes algebra, statistics and probability, and differential and integral calculus. They did not include gender or age, but did find that wider gaps between completion of high school and beginning the degree program tended to decrease grades in introductory finance.

While none have tested whether previous finance instruction improves performance in the first financial management course, the impact of previous instruction in accounting and economics on those courses has been addressed with mixed results. Eskew and Faley (1988) found that precollege study of accounting or book-keeping significantly and positively improved performance in the introductory accounting class of a large, public, state university. Other important determinants included aptitude measured by combined verbal and math SAT score, high school and college GPAs, effort measured by number of quizzes taken, and number of completed college-level hours in math and statistics courses.

Conversely, Ballard and Johnson (2004) found that performance in the introductory economics course was unrelated to previous study in economics but significantly increased with scores on a 10-question math quiz that included very basic concepts in arithmetic, algebra, and geometry given at the beginning of the semester and other measures of math ability (math ACT score, having taken Calculus, not required to take remedial math courses).

They also found that males did significantly better than females, even after controlling for math ability.

3. Data and methods

The intent of this article is to test four hypotheses suggested by our two primary references. Vihtelic (1996) argues that students would find it easier to relate to, recall and apply the financial concepts presented in the representative corporate-focused introductory finance course if they were required to take a personal finance course first. Krishnan, Bathala, Bhattacharya, and Ritchey (1999) recommend spending more time on each topic covered in Financial Management. Their top two alternatives for implementing this recommendation are (1) create a two-course finance sequence or (2) add a weekly one-hour lab to the typical three credit hour managerial finance course. Given the typical overlap of topics in the personal and managerial courses, requiring students to take a personal finance course before the managerial course is one way alternative one might be operationalized, while requiring them to take the courses concurrently might have the same effect as alternative 2. From this discussion, we draw four testable hypotheses:

Hypothesis 1: Students who take Personal Finance before taking Financial Management earn higher grades in Financial Management, on average, than other students do.

Hypothesis 2: Students who take Personal Finance and Financial Management concurrently earn higher grades in Financial Management, on average, than other students do.

Hypothesis 3: Students who take Personal Finance before taking Financial Management are more likely to pass Financial Management than other students are.

Hypothesis 4: Students who take Personal Finance and Financial Management concurrently are more likely to pass Financial Management than other students are.

To address these hypotheses, we gathered data on all the students in the first-time, full-time cohorts from 2002 to 2006 at East Carolina University (ECU) who took a face to face section of Financial Management FINA 3724, the managerial finance course required of all business majors and those earning a BS in economics. It is also among the required elective choices for programs in hospitality management, apparel merchandising, and recreation and park management. In addition to the student's grade in Financial Management, whether they took the personal finance course offered at ECU (FINA 1904) and the grade earned, and demographic data, we gathered data on several variables that prior literature suggests may affect Financial Management grades. We expect Financial Management grades to increase with math SAT scores (but we also collected verbal scores), college GPAs, and if the student is a finance or accounting major. Grades may also be affected by when students take Financial Management relative to their matriculation date. Students who take Financial Management relatively late in their college careers may be more mature, more likely to study, and more likely to have had work or life experience related to finance⁴ or they may have been putting it off because they expect it to be hard or boring. Data relevant to the finance courses are taken from a student's first attempt at the course.

Personal Finance (FINA 1904) is a three credit hour elective course that fills to its

Table 1 Descriptive statistics and frequencies

Panel A: Descriptive statistics					
	<i>N</i>	Minimum	Maximum	Mean	SD
Grade in Personal Finance	540	0	4	3.663	0.687
Grade in Financial Management	1,733	0	4	2.527	1.209
GPA	1,777	0.00	4.00	2.941	0.514
Math SAT	1,657	340	740	543.699	63.670
Verbal SAT	1,657	310	780	504.617	64.289
Male = 1	1,790	0	1	0.565	0.496
Minority = 1	1,795	0	1	0.188	0.391
Business major = 1	1,785	0	1	0.735	0.441
FIN or ACCT major = 1	1,785	0	1	0.285	0.451
First = 1	1,795	0	1	0.138	0.345
Concurrent = 1	1,795	0	1	0.041	0.199

Panel B: When students take Financial Management					
Years	1	2	3	4	> 4
Percentage of Students	1.0%	11.0%	52.3%	30.3%	5.4%

Notes: Panel A presents descriptive statistics for our full sample of all first-time, full-time students who matriculated between 2002 and 2006 and took Financial Management (FINA 3724) in a face-to-face section. Grades in Personal Finance and Financial Management are on a 0 to 4 scale with 0 indicating a failure and 4 indicating an A; there are no plus or minus grades. GPA is the cumulative college GPA in the semester before enrolling in Financial Management, also on a 0 to 4 scale. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic or Other, 0 if identified as White. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. The means for the categorical variables represent the percentage of the sample that are coded 1 for that variable. For example, male students make up 56.5% of our sample.

Panel B presents for our full sample the distribution of when students take Financial Management measured by the number of years since matriculation. Students are full-time when they matriculate but may drop down to part-time during the sample period. For those students who remain full-time, the first year since matriculation is their freshman year, the second is their sophomore year, the third is their junior year and the fourth is their senior year.

500-student capacity each semester. It is open to all majors, has no prerequisites, and is not required for any major. The course is designed to be nonthreatening, particularly to students who might otherwise avoid a math-based elective. It is widely known, for example, that more than 50% of the course grade is based on attendance and completion of assignments. The 2012–2013 Undergraduate Course Catalog⁵ states, “Topics include investing and retirement planning, career planning, money management and budgeting, taxes, consumer credit, and purchasing strategies (home, auto, insurance).” These topics appear to be fairly typical of a college-level personal finance course and are consistent with those Gold, Pryor, and Jagolinzer (2006) find in their examination of college personal finance courses.

Descriptive statistics of our data are in Table 1. There are 1,795 students who took Financial Management (FINA 3724) in a face-to-face course in the sample. Eighteen percent of them identified themselves as minorities, 14% took Personal Finance before Financial

Management, and 4% took the two courses concurrently. We are missing data on majors for 10 of these students. Of the remaining 1,785, 74% were business majors and 29% were specifically finance or accounting majors. We are missing data on sex for five students in the original sample. Fifty-seven percent of the remaining 1,790 students are male. We are missing GPA data for 18 students in the original sample. The average GPA for the remaining 1,777 students is 2.941, or just below a B average. During the sample period, plus or minus grades were not awarded. An A is 4 points, B is 3, C is 2, D is 1, and F is 0. Grades in Financial Management are missing for 62 students. The average grade for the remaining 1,733 students is 2.527, or a C. Among the 1,657 students for which we have SAT scores, the average math score is 544 and the average verbal score is 505. Among the 540 students in our sample who took Personal Finance at some point before graduating, the average course grade is 3.663, somewhat higher than the midpoint of a B. One might infer from the difference in their average course grades that Personal Finance is easier than Financial Management. This is consistent with Personal Finance's status as an elective course that is designed to be nonthreatening to students who might avoid math-based courses, while Financial Management is the required course for all business majors and the prerequisite for all higher level finance courses.

Panel B of Table 1 presents for our full sample the distribution of when students take Financial Management measured by the number of years since matriculation. Twelve percent of students take Financial Management within the first two years after matriculation; 52% of students take it during their third year; 30% take it in their fourth year; and about 6% take Financial Management more than four years after matriculating. Students must take a statistics course, a two-semester sequence of economics, and a two-semester sequence of accounting before enrolling in Financial Management; thus, most take it as juniors or seniors.

The observations for which we are missing data as noted above are not consistently missing data across variables. Some have GPA data, for example, but not SAT scores, while others have the reverse. In our univariate tests, we use all data available for each variable. However, for our multivariate tests, observations missing any variable in the regression are excluded. Therefore, our sample for the multivariate analyses consists of 1,578 students. Diagnostic tests revealed no systematic differences between the original sample and the resulting sample of 1,578.

4. Results

To begin our investigation of the effect of taking a personal finance course on students' performance in a managerial finance course, we use independent sample *t* tests to identify differences between students who take Personal Finance before taking Financial Management (first = 1) and those who do not (0), and between those who take Personal Finance in the same semester as Financial Management (concurrent = 1) and those who do not (0). We find several significant differences as shown in Table 2. On average, in Panel A we observe that those who take Personal Finance first are more likely to be men, more likely to be minorities, less likely to be business majors, and have lower verbal SAT scores, lower cumulative college GPAs in the year before Financial Management, and earn lower grades

Table 2 *t* tests of how students who take Personal Finance before or concurrently with Financial Management differ from other Financial Management students

Panel A: Sample = all first-time, full-time students who matriculated between 2002 and 2006 and took Financial Management (FINA 3724) in a face-to-face section

	First = 1	<i>N</i>	Mean	SD	<i>t</i>	Mean difference	Concurrent = 1	<i>N</i>	Mean	SD	<i>t</i>	Mean difference
Grade in Personal Finance	1	247	3.462	0.800	-6.265	-0.371***	1	74	3.838	0.439	3.332	0.203***
	0	293	3.833	0.520	(0.000)		0	466	3.635	0.715	(0.001)	
Grade in Financial Management	1	232	2.203	1.234	-4.420	-0.375***	1	74	2.784	1.063	2.106	0.268**
	0	1,501	2.578	1.198	(0.000)		0	1,659	2.516	1.214	(0.038)	
GPA	1	246	2.729	0.470	-7.517	-0.246***	1	74	2.918	0.469	-0.393	-0.024
	0	1,531	2.975	0.513	(0.000)		0	1,703	2.942	0.516	(0.695)	
Math SAT	1	231	538.355	64.119	-1.376	-6.210	1	69	530.145	55.875	-1.808	-14.143*
	0	1,426	544.565	63.577	(0.169)		0	1,588	544.288	63.938	(0.071)	
Verbal SAT	1	231	493.290	61.866	-2.893	-13.162***	1	69	487.971	53.098	-2.634	-17.369***
	0	1,426	506.452	64.507	(0.004)		0	1,588	505.340	64.648	(0.010)	
Business major	1	246	0.614	0.488	-4.261	-0.141***	1	74	0.811	0.394	1.680	0.079*
	0	1,539	0.754	0.431	(0.000)		0	1,711	0.732	0.443	(0.097)	
FIN or ACCT major	1	246	0.248	0.433	-1.420	-0.042	1	74	0.270	0.447	-0.279	-0.015
	0	1,539	0.290	0.454	(0.157)		0	1,711	0.285	0.452	(0.780)	
Male	1	247	0.757	0.430	7.399	0.223***	1	74	0.527	0.503	-0.669	-0.039
	0	1,543	0.534	0.499	(0.000)		0	1,716	0.566	(0.503)		
Minority	1	248	0.246	0.432	2.323	0.068**	1	74	0.243	0.389	1.133	0.058
	0	1,547	0.178	0.383	(0.021)		0	1,721	0.185	0.389	(0.261)	

Notes: Independent sample *t* tests reported. *p*-values are in parentheses. ***, **, and * indicate that differences are significant at the 1%, 5% and 10% level, respectively. The sample is all first-time, full-time students who matriculated between 2002 and 2006 and took Financial Management (FINA 3724) in a face-to-face section. The left subpanel compares students who took Personal Finance before Financial Management (First = 1) to all other Financial Management students (First = 0). The right subpanel compares students who took Personal Finance and Financial Management in the same semester (Concurrent = 1) to all other Financial Management students (Concurrent = 0). Grades in Personal Finance and Financial Management are on a 0 to 4 scale with 0 indicating a failure and 4 indicating an A; there are no plus or minus grades. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic or Other, 0 if identified as White. The means for the categorical variables represent the percentage of the subsamples that are coded 1 for that variable. For example, only 61.4% of the students who took Personal Finance before Financial Management are business majors, while 75.4% of the students who did not take Personal Finance first are business majors. That is a difference of 14 percentage points and is significant at the 1% level indicating that there is a significantly lower proportion of business majors in the subsample of students who took Personal Finance before taking Financial Management than there is in the subsample of those that did not.

Table 2 (Continued)

Panel B: Sample = all first-time, full-time students who matriculated between 2002 and 2006, took Financial Management (FINA 3724) in a face-to-face section and took Personal Finance at any point before leaving ECU

	First = 1	N	Mean	SD	t	Mean difference	Concurrent = 1	N	Mean	SD	t	Mean difference
Grade in Personal Finance	1	247	3.462	.800	-6.265	-.371***	1	74	3.838	0.439	3.534	0.218***
	0	293	3.833	.520	(0.000)		0	468	3.620	0.752	(0.001)	
Grade in Financial Management	1	232	2.203	1.234	-4.640	-.496***	1	74	2.784	1.063	2.620	0.359***
	0	285	2.698	1.187	(0.000)		0	443	2.424	1.251	(0.010)	
GPA	1	246	2.729	.470	-6.844	-.283***	1	74	2.918	0.469	0.660	0.041
	0	291	3.012	.484	(0.000)		0	463	2.877	0.502	(0.510)	
Math SAT	1	231	538.355	64.119	.176	.977	1	69	530.145	55.875	-1.122	-8.923
	0	267	537.388	58.905	(0.860)		0	429	539.068	62.120	(0.262)	
Verbal SAT	1	231	493.290	61.866	-.923	-5.137	1	69	487.971	53.098	-1.323	-9.372
	0	267	498.427	61.977	(0.356)		0	429	497.343	63.178	(0.189)	
Business major	1	246	.614	.489	-5.866	-.222***	1	74	0.811	0.394	1.753	0.088*
	0	293	.836	.371	(0.000)		0	465	0.723	0.448	(0.083)	
FIN or ACCT major	1	246	.248	.432	-2.722	-.107***	1	74	0.270	0.447	-0.719	-0.042
	0	293	.355	.479	(0.007)		0	465	0.312	0.464	(0.472)	
Male	1	247	.757	.430	4.697	.187***	1	74	0.527	0.503	-2.389	-0.149**
	0	293	.570	.496	(0.000)		0	466	0.676	0.469	(0.019)	
Minority	1	248	.246	.431	1.257	.045	1	74	0.243	0.432	0.486	0.025
	0	294	.201	.401	(0.209)		0	468	0.218	0.413	(0.627)	

Notes: Independent sample *t* tests reported. *p*-values are in parentheses. ***, **, and * indicate that differences are significant at the 1%, 5% and 10% level, respectively. The sample is all first-time, full-time students who matriculated between 2002 and 2006, took Financial Management (FINA 3724) in a face-to-face section and took Personal Finance at any point before leaving ECU. The left subpanel compares students who took Personal Finance before Financial Management (First = 1) to all other Financial Management students in this sample (First = 0). The right subpanel compares students who took Personal Finance and Financial Management in the same semester (Concurrent = 1) to all other Financial Management students in this sample (Concurrent = 0). Grades in Personal Finance and Financial Management are on a 0 to 4 scale with 0 indicating a failure and 4 indicating an A; there are no plus or minus grades. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. The means for the categorical variables represent the percentage of the subsamples that are coded 1 for that variable. For example, only 61.4% of the students who took Personal Finance before Financial Management are business majors, while 83.6% of the students who did not take Personal Finance first are business majors. That is a difference of 22 percentage points and is significant at the 1% level indicating that there is a significantly lower proportion of business majors in the subsample of students who took Personal Finance before taking Financial Management than there is in the subsample of those that did not.

Table 2 (Continued)

Panel C: Sample = all first-time, full-time students who matriculated between 2002 and 2006, took Financial Management (FINA 3724) in a face-to-face section and graduated as business majors

	First = 1	N	Mean	SD	t	Mean difference	Concurrent = 1	N	Mean	SD	t	Mean difference
Grade in Personal Finance	1	150	3.627	0.710	-4.731	-0.292***	1	60	3.933	0.312	2.944	0.148***
	0	245	3.918	0.329	(0.000)		0	335	3.785	0.554	(0.004)	
Grade in Financial Management	1	144	2.625	1.057	-1.521	-0.145	1	60	3.000	0.939	1.814	0.258*
	0	1139	2.770	1.080	(0.128)		0	1,223	2.742	1.083	(0.070)	
GPA	1	150	2.911	0.400	-4.704	-0.166***	1	60	3.045	0.411	-0.214	-0.013
	0	1,151	3.077	0.454	(0.000)		0	1,241	3.058	0.453	(0.831)	
Math SAT	1	143	538.601	60.858	-1.072	-5.973	1	56	532.143	52.733	-1.436	-12.296
	0	1,080	544.574	62.849	(0.284)		0	1,167	544.439	63.024	(0.151)	
Verbal SAT	1	143	492.098	58.332	-2.669	-14.902***	1	56	492.679	52.932	-1.803	-13.183*
	0	1,080	507.000	63.311	(0.008)		0	1,167	505.861	63.305	(0.076)	
FIN or ACCT major	1	151	0.404	0.492	0.450	0.019	1	60	0.333	0.475	-0.897	-0.056
	0	1,161	0.385	0.487	(0.653)		0	1,252	0.390	0.488	(0.373)	
Male	1	151	0.722	0.450	5.409	0.213***	1	60	0.483	0.504	-0.792	-0.052
	0	1,160	0.509	0.500	(0.000)		0	1,251	0.536	0.499	(0.429)	
Minority	1	151	0.199	0.400	0.868	0.030	1	60	0.250	0.437	1.420	0.081
	0	1,161	0.169	0.375	(0.386)		0	1,252	0.169	0.374	(0.160)	

Notes: Independent sample *t* tests reported. *p*-values are in parentheses. ***, **, and * indicate that differences are significant at the 1%, 5% and 10% level, respectively. The sample is all first-time, full-time students who matriculated between 2002 and 2006, took Financial Management (FINA 3724) in a face-to-face section and graduated as business majors. The left subpanel compares students who took Personal Finance before Financial Management (First = 1) to all other Financial Management students in this sample (First = 0). The right subpanel compares students who took Personal Finance before Financial Management (First = 1) to all other Financial Management students in this sample. (Concurrent = 0). Grades in Personal Finance and Financial Management are on a 0 to 4 scale with 0 indicating a failure and 4 indicating an A; there are no plus or minus grades. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. The means for the categorical variables represent the percentage of the subsamples that are coded 1 for that variable. For example, 72.2% of the business majors who took Personal Finance before Financial Management are males, while only 50.6% of the business majors who did not take Personal Finance first are males. That is a difference of 21.3 percentage points and is significant at the 1% level indicating that there is a significantly higher proportion of men in the subsample of business majors who took Personal Finance before taking Financial Management than there is in the subsample of business majors that did not.

in Financial Management than students who do not take Personal Finance first. They also earn lower grades in Personal Finance than other students. All differences noted are significant at the 1% level except the relative proportion of minority students in each subsample, which is significantly different at the 5% level. Contrary to Hypothesis 1, taking the Personal Finance first is associated with a decrease in average grades of nearly 0.4 in both courses. In contrast, turning our attention to students who took the personal and managerial finance courses concurrently, we see in Panel B a significant increase in the average grades for both courses of more than 0.2 relative to all other students, which is consistent with Hypothesis 2. “Concurrent” students also average about 14 points lower on the math SAT but are nearly 10% more likely to be business majors than other students are.

We infer from the results presented above that students who choose to take Personal Finance seem to differ from the other students who take Financial Management with respect to college GPA, math SAT score, gender and major. As noted in the Literature review, previous research indicates that performance in the managerial class may be related to these variables. Moving forward, we will attempt to control for these important differences by examining subsamples and using multivariate methods. We first examine the subsample of just those students who took both Personal Finance and Financial Management in any sequence and use independent sample *t* tests to compare those who took Personal Finance first to those who took it with or after Financial Management, and to compare those who took Personal Finance with Financial Management to those who took it before or after the managerial course. Results are in Table 2: Panel B. Again our results are inconsistent with Hypothesis 1 and consistent with Hypothesis 2. Students who take Personal Finance first tend to have significantly lower grades in both finance courses and lower GPAs than other students who take Personal Finance. They are also less likely to be business majors and more likely to be male. Conversely, concurrent students’ grades in both courses are significantly higher than those of other Personal Finance students; their Financial Management grades are 15% higher on average. Otherwise, concurrent students do not differ significantly from other Personal Finance students except that they are significantly more likely to be business majors. GPAs and SAT scores are statistically equal.

In another attempt to control for sample differences, we consider the subsample of business majors. As noted in the Methodology section, Financial Management is required for all business majors but other majors, including economics and hospitality management, are either required or encouraged to take it. The results of the independent sample *t* tests are in Table 2: Panel C. Now it appears that taking Personal Finance first does not significantly affect the grade earned in Financial Management, but it may significantly lower the average grade in Personal Finance, as in Panel B. The lower Personal Finance grades for those who take it first may reflect the students’ lack of maturity. Financial Management is generally taken by juniors and seniors because the course has several prerequisites including a two-course accounting sequence. If students are taking Personal Finance before Financial Management, they are likely to be freshmen or sophomores at the time.

Comparing business majors who take the Personal and Financial Management courses concurrently to other business majors, we again find that taking the courses concurrently seems to improve grades in both. The only other significant difference between business students who took the finance courses concurrently and those that did not is their average

verbal SAT scores. Concurrent business students' scores are about 3% lower, but we know of no previous literature that associates grades in finance courses with verbal SAT scores.

In short, our *t* tests provide no support for Hypothesis 1. Taking Personal Finance first appears to have no effect on grades in Financial Management once we control for important differences among students. However, we do find strong support for Hypothesis 2. Whether we include the full sample, just students who took Personal Finance at any time, or just business majors, we find that students who take the two finance courses concurrently earn significantly higher grades in both courses. Now we turn to multivariate tests to see whether our findings hold after controlling for other explanatory variables.

Because our dependent variable, students' grades in Financial Management, is a discrete variable, the appropriate regression technique is ordered probit, or ordinal, regression.⁶ To test Hypotheses 1 and 2, we include as our key explanatory variables dummies set equal to 1 if a student took Personal Finance before Financial Management (First = 1) or if a student took the courses concurrently (Concurrent = 1). If both First and Concurrent are 0, the student either did not take Personal Finance at ECU or took it after Financial Management. Our control variables are those described in the Methodology section: math and verbal SAT scores, GPA before taking Financial Management, time from matriculation to Financial Management, and dummies set to 1 if the student is male, identified as a minority, a business major, or a finance or accounting major. We run the regression on three different samples: the full sample (Model 1), just students who took Personal Finance at any time (Model 2), and just business majors (Model 3). We also run it again on the full sample replacing the First and Concurrent dummy variables with First-Grade and Concurrent-Grade, which are the products of the dummy variables and the grade the student earned in Personal Finance. The results are in Table 3.

Like the results of our *t* tests, the regression results in Table 3 are inconsistent with Hypothesis 1 but consistent with Hypothesis 2. The coefficient on the First dummy is statistically equal to zero in all four models, while the coefficient on the Concurrent dummy is significantly positive ($p < 0.05$) in all four models. Students who take the Personal and Financial Management courses at the same time appear to earn higher grades in Financial Management than other students do, but those who take Personal Finance first do not. The other results are consistent with previous literature. Business majors, particularly finance and accounting majors, and students with higher math SAT scores and higher GPAs tend to earn higher grades in the Financial Management course.

To this point, we have focused on Hypotheses 1 and 2, which concern students' grades. Now we consider the possibility that for some students their goal is simply to pass Financial Management, and we examine whether taking Personal Finance before (Hypothesis 3) or with Financial Management (Hypothesis 4) helps them achieve that goal. We define passing as earning a C or better for two reasons. First, only 9.28% of our full sample and only 4.91% of our business majors fail Financial Management in our sample, making it highly unlikely that we will see any significant differences in failure rates between those who take Personal Finance either first or concurrently and those who do not. Second, although D may mean "diploma" to some students, faculty may view D students as no more likely to retain or be able to apply the material than F students.

Because our dependent variable is now categorical: 1 if students earned an A, B, or C in

Table 3 Ordinal models of the effect of the Personal Finance course on the Financial Management course grade

	Model 1		Model 2		Model 3		Model 4	
	Coefficient	Wald (p-value)	Coefficient	Wald (p-value)	Coefficient	Wald (p-value)	Coefficient	Wald (p-value)
Math SAT	.002***	18.119 (0.000)	.003***	8.479 (0.004)	.001**	5.388 (0.020)	.002***	17.979 (0.000)
Verbal SAT	-.001**	7.538 (0.026)	-.001	1.688 (0.194)	-.001*	3.490 (0.062)	-.001***	7.495 (0.006)
GPA	1.232***	313.757 (0.000)	1.229***	81.640 (0.000)	1.260***	209.864 (0.000)	1.234***	315.097 (0.000)
Time to Managerial	.016***	21.854 (0.000)	.010	1.661 (0.197)	.008	2.580 (0.108)	.016***	21.869 (0.000)
Male = 1	-.036	0.385 (0.535)	.039	.113 (0.737)	-.026	0.157 (0.692)	-.036	0.373 (0.541)
Minority = 1	-.193**	6.652 (0.010)	-.003	.001 (0.980)	-.179**	4.159 (0.041)	-.193**	6.658 (0.010)
Business Major = 1	.275***	14.111 (0.000)	.256*	3.254 (0.071)			.274***	13.976 (0.000)
Fin or Acct Major = 1	.539***	62.540 (0.000)	.488***	15.613 (0.000)	.529***	57.571 (0.000)	.539***	62.527 (0.000)
First = 1	-.070	0.739 (0.390)	-.047	.145 (0.703)	.025	0.059 (0.808)	-.019	0.721 (0.396)
Concurrent = 1	.338**	6.168 (0.013)	.340**	4.704 (0.030)	.376**	6.013 (0.014)	.094***	7.079 (0.008)
χ^2	639.389***	(0.000)	190.406***	(0.000)	366.102***	(0.000)	640.292***	(0.000)
R ²	.333		.334		.265		.334	
n	1,578		469		1187		1578	

Notes: The models are ordinal regressions with the Financial Management course grade as the dependent variable. A, B, C, D, and F are represented by 4, 3, 2, 1, and 0, respectively; there are no plus or minus grades. Model 1 uses the full sample of all first-time, full-time students who matriculated between 2002 and 2006 and took Financial Management (FINA 3724) in a face-to-face section. Model 2 includes only those students who took Personal Finance. Model 3 includes only Business Majors. Model 4 uses the full sample but the first and concurrent dummies are replaced with first-grade and concurrent-grade, the product of the dummy variable and the grade the student earned in the Personal Finance course. A zero in first-grade or concurrent-grade indicates that the student either did not take the Personal Finance course before or concurrently with managerial finance or that the student failed the Personal Finance course. The χ^2 and the Cox & Snell R² are presented for each model. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Time to Managerial is the number of semesters between matriculation and taking Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. First = 1 if the student took Personal Finance before Financial Management, 0 otherwise. Concurrent = 1 if students took Personal Finance and Financial Management in the same semester, 0 otherwise. ***, **, and * indicate that coefficients are significantly from zero at the 1%, 5% and 10% level, respectively.

Financial Management and 0 if they did not, the appropriate methodology is logistic regression. We use the same explanatory variables and the same samples as we did in our ordinal regressions on grades.⁷ The results are in Table 4. They do not support Hypothesis 3; taking Personal Finance first either decreases the student's likelihood of earning a C or better (in the full sample) or has no effect. However, the results are consistent with Hypothesis 4. The coefficient for the Concurrent dummy is significantly positive when we use either the full sample or the sample of all students who took Personal Finance at any time before graduating. Among those samples, the odds of earning a C or better are about three times higher for students who take the courses concurrently than they are for other students.

In contrast, taking the courses concurrently seems to have no significant effect on a business major's likelihood of getting a C or better. This differs from the results in Table 3, which indicate that business majors who take the courses concurrently seem to earn higher grades in Financial Management. However, this difference is not terribly surprising in this subsample. Only 11.94% of business majors earned Ds or Fs compared with 18.98% of students in the full sample (see Table 5). The Cox & Snell R^2 is only 5.8% for our model in the subsample of business students, which is less than half of what it is in our full sample (15.5%). Perhaps for the relatively small percentage of business students who do not earn a C or better, some personal circumstance for which we cannot control makes the difference. For the majority of business students, simply passing the Financial Management class appears to be a given. Their goal is probably to earn the highest grade possible, which as indicated in Table 3, seems to be furthered by taking the Personal and Financial Management courses concurrently.

Thus far, the results of our analyses are consistent with the supposition that taking Personal Finance and Financial Management concurrently can improve a student's grade in both courses. Table 5 presents an informal look at this effect. In Panel A, we show the distributions of grades in Financial Management for five different groups of students: (1) all students who took Financial Management excluding those who took it concurrently with Personal Finance, (2) all students who took both Financial Management and Personal Finance but did not take them concurrently, (3) all students who took Financial Management and Personal Finance concurrently, (4) all business majors excluding those who took Financial Management and Personal Finance concurrently, and (5) all business majors who took Financial Management and Personal Finance concurrently. Comparing Group 3 to Group 1, we observe that the failure rates (D or F) of students who took the courses concurrently is less than half that of other students. Additionally, concurrent students seem to be less likely than other students to earn Bs but more likely to earn As. These patterns are repeated when we compare Groups 3 and 2 and Groups 5 and 4. Relative to each comparison group, taking the finance courses concurrently appears to turn D or F students into C students and B students into A students.

In Panel B, we show grade distributions for the Personal Finance course broken down by the categories described above. Group 1, the full sample, is not relevant here because it includes many students who did not take Personal Finance and therefore earned no grade. In this panel, the effect of taking the finance courses concurrently seems even more pronounced. All the students who took the courses concurrently earned at least a C in Personal Finance. Furthermore, a smaller proportion of those students earned Bs or Cs and a larger proportion

Table 4 Logistic models of the effect of Personal Finance course on likelihood of earning a C or better in Financial Management

	Model 1			Model 2			Model 3		
	Coefficient	Odds Ratio	Wald (p-value)	Coefficient	Odds Ratio	Wald (p-value)	Coefficient	Odds Ratio	Wald (p-value)
Math SAT	.003**	1.003	4.523 (0.033)	.002	1.002	0.650 (0.420)	-.001	.999	0.235 (0.628)
Verbal SAT	-.004***	.996	10.178 (0.001)	-.001	.999	0.194 (0.660)	-.004**	.996	4.444 (0.035)
GPA	1.624***	5.074	73.421 (0.000)	1.516***	4.553	18.148 (0.000)	1.733***	5.658	41.440 (0.000)
Time to Managerial	.039***	1.040	17.773 (0.000)	.028	1.029	2.349 (0.125)	.025*	1.026	2.779 (0.095)
Male = 1	-.046	.955	0.085 (0.771)	.399	1.491	1.815 (0.178)	.103	1.108	0.260 (0.610)
Minority = 1	-.365*	.694	3.724 (0.054)	-.291	.748	0.846 (0.358)	-.375	.687	2.184 (0.139)
Business Major = 1	1.008***	2.741	34.282 (0.000)	1.283***	3.608	15.306 (0.000)			
Fin or Acct Major = 1	.782***	2.185	12.316 (0.000)	.454	1.574	1.565 (0.211)	.785***	2.192	11.947 (0.001)
First = 1	-.401**	.670	4.187 (0.041)	-.163	.850	0.271 (0.603)	.015	1.016	0.003 (0.959)
Concurrent = 1	.945**	2.574	4.200 (0.040)	1.236**	3.443	5.679 (0.017)	.857	2.356	1.973 (0.160)
Constant	-4.238***	.014	21.020 (0.000)	-5.385***	.005	9.369 (0.002)	-1.558	.210	1.491 (0.222)
χ^2	265.046***		(0.000)	90.242***		(0.000)	71.045***		(0.000)
R ²	.155			.175			.058		
n	1,578			469			1187		

Notes: The models are logistic regressions with the dependent variable set to 1 if the student earned an A, B, or C in Financial Management. Model 1 uses the full sample of all first-time, full-time students who matriculated between 2002 and 2006 and took Financial Management (FINA 3724) in a face-to-face section. Model 2 includes only students who took Personal Finance. Model 3 includes only Business Majors. The χ^2 and the Cox & Snell R² are presented for each model. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Time to Managerial is the number of semesters between matriculation and taking Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. First = 1 if the student took Personal Finance before Financial Management, 0 otherwise. Concurrent = 1 if students took Personal Finance and Financial Management in the same semester, 0 otherwise. ***, **, *, and * indicate that coefficients are significantly from zero at the 1%, 5% and 10% level, respectively.

Table 5 How the grades of students who took personal finance and financial management concurrently compare to those of other students

Panel A: Grades in Financial Management							
		F	D	C	B	A	Total
Full Sample (1)	<i>N</i>	154	161	411	541	392	1659
	%	9.28	9.70	24.77	32.61	23.63	100.00
Personal Finance Students (2)	<i>N</i>	45	58	103	138	99	443
	%	10.16	13.09	23.25	31.15	22.35	100.00
Concurrent (3)	<i>N</i>	3	3	24	21	23	74
	%	4.05	4.05	32.43	28.38	31.08	100.00
Business Majors(4)	<i>N</i>	60	86	298	445	334	1223
	%	4.91	7.03	24.37	36.39	27.31	100.00
Business Majors and Concurrent (5)	<i>N</i>	0	3	17	17	23	60
	%	0.00	5.00	28.33	28.33	38.33	100.00
Panel B: Grades in Personal Finance							
		F	D	C	B	A	Total
Personal Finance Students (2)	<i>N</i>	2	7	32	77	348	466
	%	0.43	1.50	6.87	16.52	74.68	100.00
Concurrent (3)	<i>N</i>	0	0	2	8	64	74
	%	0.00	0.00	2.70	10.81	86.49	100.00
Business Majors(4)	<i>N</i>	1	1	14	37	282	335
	%	0.30	0.30	4.18	11.04	84.18	100.00
Business Majors & Concurrent (5)	<i>N</i>	0	0	1	2	57	60
	%	0.00	0.00	1.67	3.33	95.00	100.00

Notes: Grade distributions for the Financial Management and Personal Finance courses are presented. Students are categorized into five groups: (1) all students who took Financial Management excluding those who took it concurrently with Personal Finance, (2) all students who took both Financial Management and Personal Finance but did not take them concurrently, (3) all students who took Financial Management and Personal Finance concurrently, (4) all business majors excluding those who took Financial Management and Personal Finance concurrently, and (5) all business majors who took Financial Management and Personal Finance concurrently. Groups 1 and 3 include those in Groups 4 and 5, respectively. *N* for Group 2 differs across Panels A and B because of missing data. Group 4 in panel B is all business majors who took Financial Management and Personal Finance but did not take them concurrently.

earned As relative to students who did not take the finance courses concurrently. Among business majors who took the courses concurrently 95% earned As in Personal Finance. Only 84% of other business students earned As, and some of those students took Financial Management first.

In our preceding univariate and multivariate analyses, we find what we believe is fairly strong and consistent evidence that taking Personal Finance and Financial Management concurrently helps students do better in both courses. Before discussing our results and their implications, we take one last look at our sample, this time considering those students who may be less likely to succeed in Financial Management separately from those who may be more likely to succeed. As noted in the literature review, other authors have concluded that math aptitude and GPA are important predictors of a student's success in the typical introductory managerial finance course. Therefore, to categorize students as more or less likely to succeed in Financial Management, we compute a measure of likely success,

GPASAT, as the cumulative college GPA in the semester before enrolling in Financial Management times the math SAT score reported for each student. Those with a GPASAT below (at or above) the median of 1,569⁸ were classified those less (more) likely to succeed. Then we repeat the ordinal and logistic regression models used in our earlier analysis using the below-median and above-median subsamples. Specifically, we use ordinal regression to regress grades in Financial Management on our explanatory and control variables and logistic regression to regress the dummy variable that indicates whether a student passed the managerial course with a C or better on our explanatory and control variables. The results obtained when we used the subsample of students with below median GPASAT scores are presented in Table 6.

In the ordinal regression results in Table 6 we see no evidence that taking Personal Finance either before or with Financial Management affects the likelihood that these students will earn higher grades. Neither the First nor the Concurrent dummy has a significant coefficient. However, as in our previous analyses, GPA, time (maturity), and majoring in business do appear to significantly increase the likelihood of earning higher grades. In contrast, the logistic results indicate that taking the finance courses concurrently increases by 2.5 times a “below-median” student’s odds of passing Financial Management. As we have seen in some of our earlier analyses, the First coefficient is significantly negative, suggesting that taking Personal Finance first reduces a student’s odds of passing Financial Management. We believe that is an artifact of the possible selection biases we noted above, particularly that students who take Personal Finance first tend to have lower GPAs than do the other students in the full sample.

Of interest, in Table 7 where the results of the regressions using the subsample of students with at or above median GPASAT scores are presented, we find the reverse of the results in Table 6. Our findings using the “above-median” subsample suggest that taking both courses concurrently increases the likelihood that these students will earn higher grades in Financial Management but has no effect on their odds of passing the course. It seems that among students with relatively high GPAs and math SAT scores, getting at least a C in the managerial course can be almost taken for granted. These students are more likely to be aiming for higher grades, and taking the personal and managerial courses concurrently seems to help them do that in Financial Management. Conversely, the students with relatively low GPAs and math SAT scores cannot take passing for granted. Taking the personal and managerial courses concurrently seems to help them pass.

5. Discussion and conclusion

Vihtelic (1996) suggested that the finance curriculum should be redesigned with a personal finance course acting as a student-centered introduction to the managerial finance course. We cannot examine the effect that such a curriculum change would have on student learning in the managerial finance course, but we do look at the effect on students who elect to take a personal finance course either concurrently or before taking their managerial finance course. We use the ordered probit or ordinal regression methodology because our dependent

Table 6 Effects of Personal Finance on Financial Management grades of those who may be less likely to succeed

	Model 1: Ordinal		Model 2: Logistic		
	Estimate	Wald (significance)	B	Exp(B)	Wald (significance)
Math SAT	.001	1.468 (0.226)	.003	1.003	1.714 (0.190)
Verbal SAT	-.002**	5.436 (0.020)	-.005***	.995	7.580 (0.006)
GPA	.501***	13.253 (0.000)	.572*	1.771	3.570 (0.059)
Time to Managerial	.018***	15.297 (0.000)	.041***	1.042	14.003 (0.000)
Male = 1	-.003	0.001 (0.971)	-.024	.976	0.016 (0.901)
Minority = 1	-.162*	2.728 (0.099)	-.244	.783	1.158 (0.282)
Business Major = 1	.612***	36.313 (0.000)	1.531***	4.624	47.499 (0.000)
Fin or Acct Major = 1	.524***	24.360 (0.000)	.682**	1.978	5.091 (0.024)
First = 1	-.122	1.438 (0.231)	-.450**	.638	3.993 (0.046)
Concurrent = 1	.095	0.287 (0.592)	.924*	2.519	3.197 (0.074)
Constant			-1.570	.208	1.039 (0.308)
χ^2	144.019***	(0.000)	124.751***		(0.000)
R ²	0.169		.148		
n	778		778		

Notes: Model 1 is an ordinal regression with the Financial Management course grade as the dependent variable. A, B, C, D, and F are represented by 4, 3, 2, 1, and 0, respectively. Model 2 is a logistic regression with the dependent variable set to 1 if the student earned an A, B, or C in Financial Management. We computed a measure of likely success, GPASAT, as GPA times math SAT score. Both models use the subsample of all students whose GPASAT fell below the median GPASAT of 1569. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Time to Managerial is the number of semesters between matriculation and taking Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. First = 1 if the student took Personal Finance before Financial Management, 0 otherwise. Concurrent = 1 if students took Personal Finance and Financial Management in the same semester, 0 otherwise. ***, **, and * indicate that coefficients are significantly from zero at the 1%, 5% and 10% level, respectively.

variable, students' grades in Financial Management, is an ordinal variable; it can be ranked but the true distance between the categories is not definable. We control for variables that other researchers have found to positively affect grades in the introductory managerial finance course: math SAT scores and college GPA, and find that as they increase the likelihood of the student earning a higher grade in Financial Management also increases. We

Table 7 Effects of Personal Finance on Financial Management grades of those who may be more likely to succeed

	Model 1: Ordinal		Model 2: Logistic		
	Estimate	Wald (significance)	B	Exp(B)	Wald (significance)
Math SAT	.003***	14.512 (0.000)	.004	1.004	1.532 (0.216)
Verbal SAT	-.002***	6.613 (0.010)	-.005**	.995	5.841 (0.016)
GPA	1.877***	202.882 (0.000)	3.432***	30.931	42.662 (0.000)
Time to Managerial	.016***	8.655 (0.003)	.038**	1.038	4.803 (0.028)
Male = 1	-.027	0.103 (0.749)	.049	1.050	0.030 (0.862)
Minority = 1	-.213*	3.269 (0.071)	-.661*	.516	3.592 (0.058)
Business Major = 1	.153	1.691 (0.194)	.450	1.568	1.902 (0.168)
Fin or Acct Major = 1	.521***	32.112 (0.000)	.835**	2.304	6.191 (0.013)
First = 1	.015	0.011 (0.917)	-.125	.883	0.086 (0.769)
Concurrent = 1	.767***	11.158 (0.001)	1.117	3.055	1.125 (0.289)
Constant			-9.370***	.000	10.506 (0.001)
χ^2	290.503***	(0.000)	90.488***	(0.000)	
R ²	0.305		.107		
n	800		800		

Notes: Model 1 is an ordinal regression with the Financial Management course grade as the dependent variable. A, B, C, D, and F are represented by 4, 3, 2, 1, and 0, respectively. Model 2 is a logistic regression with the dependent variable set to 1 if the student earned an A, B, or C in Financial Management, 0 otherwise. There are no plus or minus grades. We computed a measure of likely success, GPASAT, as GPA times math SAT score. Both models use the subsample of all students whose GPASAT fell at or above the median GPASAT of 1569. GPA is the cumulative college GPA in the semester before enrolling in Financial Management. Time to Managerial is the number of semesters between matriculation and taking Financial Management. Business Major is coded 1 if the student graduated as a business major with a concentration in finance, accounting, management, management of information systems, or marketing and supply chain management. Finance/Accounting Major (FIN/ACCT) is coded 1 if the student graduated as a business major with a concentration in finance or accounting. Male is coded 1 if the student's record identifies him as male, 0 if female. Minority is coded 1 if the student is identified as African American, Asian, American Indian, Hispanic, or Other, 0 if identified as White. First = 1 if the student took Personal Finance before Financial Management, 0 otherwise. Concurrent = 1 if students took Personal Finance and Financial Management in the same semester, 0 otherwise. ***, **, and * indicate that coefficients are significantly from zero at the 1%, 5% and 10% level, respectively.

also control for sex, minority status, and when the student took Financial Management relative to his matriculation date.

We cannot control for the instructor, textbook, and/or homework system used in each course. Though these could affect grades in Financial Management, we have no a priori reason to expect that these variables would be correlated with whether a student took

Personal Finance and when. We also cannot control for hours studied, but would expect it to be correlated with a student's cumulative GPA. Furthermore, less effective students might study longer but learn less. For example, Didia and Hasnat (1998) find that hours studied is negatively related to grades in Financial Management. We do not include controls for semester load when taking Financial Management. Because our students are from first-time, full-time cohorts, we may have little variation in loads. Furthermore, those who are allowed to take overload have high GPAs, so we might have difficulty disentangling the effects of GPA from those of load. There are no transfer students in our data.

Prior research also suggests that student motivation is an important determinant of how much students learn from their Personal Finance course. Though we cannot measure motivation, we include dummy variables to indicate whether a student is majoring in business and if specifically in finance or accounting. We believe that finance and accounting majors are more likely to find the class interesting and relevant to their careers and thus be more motivated than other business majors, who in turn may still be more motivated than nonbusiness majors. Our results are consistent with this supposition. Finance and accounting majors are significantly more likely to earn higher grades than others in full sample and across all subsamples. The same is true for business majors in all specifications and subsamples except in the subsample of students whose combined GPA and math SAT score suggest they are already likely to do well.

We find no support for the hypotheses that students who take Personal Finance first either earn higher grades or have higher passing rates in Financial Management than students who do not. We do not find a positive association between the First dummy and our dependent variables in any of our models or specifications. Though we are disappointed by these findings, perhaps we should not be surprised by them. Students who take Personal Finance first tend to be freshmen or sophomores when they take Personal Finance and juniors or seniors when they take Financial Management. It is possible that lack of maturity and time between the classes diminishes retention. After all, finance professors often lament that students seem to forget what they are supposed to have learned in accounting, statistics, economics and even other finance classes. Why should Personal Finance be any different?

Furthermore, the Personal Finance course at ECU is an elective that is not designed to be a rigorous introduction to Financial Management. Although most managerial faculty and the textbooks they use attempt to relate managerial topics to personal finance topics to enhance student comprehension, there is currently no systematic connection made between the Personal Finance course and the Financial Management course as there might be if the curriculum were redesigned as Vihtelic recommends. Therefore, while our results cannot be used to advocate such a redesign, neither should they be used to argue against it. A formal curriculum change along the lines she suggests could have better results than we see in our data.

It should also be noted that our analysis is in no way intended to assess the value of the Personal Finance course with respect to other desirable outcomes such as increasing students' understanding of loans and mortgages, making them aware of the importance of financial planning and maintaining their personal credit ratings, or reducing their likelihood of engaging in financially risky behaviors such as overusing credit cards. In informal discussions with College of Business advising staff and students who have taken the Personal Finance course, we have found that students generally give the course high ratings and report that it has been a valuable experience.

In sharp contrast to our findings with respect to taking Personal Finance first, our other findings strongly support the hypotheses that taking the Personal Finance and Financial Management classes concurrently improves both students' grades and passing rates in Financial Management. Consistently, we find that the Concurrent dummy is significantly and positively associated with higher grades in ordinal regressions and with passing Financial Management in logistic regressions. We offer the following possible explanations for these results. First, Personal Finance homework assignments and problems may complement those assigned in Financial Management, effectively doubling the amount of time students spend on finance-related reading and problem-solving in a given semester. In effect, the Personal Finance course seems to act like the lab that Krishnan, Bathala, Bhattacharya, and Ritchey suggest to improve delivery of the introductory finance course. Second, hearing similar concepts discussed by two different professors and from the personal and corporate point of view in the same semester may increase the likelihood and frequency of those "light-bulb" moments that students need to truly internalize the material. Third, a full-time student takes five or six classes per semester. Because Financial Management is a prerequisite for all other finance courses offered at ECU except Personal Finance and a Financial Markets course, many students have their attention divided among at least four other nonfinance courses when they take Financial Management. Perhaps taking two finance courses (that are not designed to be taken sequentially) in the same semester increases the students' ability to focus on finance concepts. We do not examine whether taking Financial Management and Financial Markets together has a similar effect, but we believe it is likely.

Our results seem to support a recommendation that students planning to take the typical business school introductory finance course should also take a personal finance course at the same time. However, we include three caveats. First, as always, we must stress that *t* tests and regression analysis may indicate association, but do not prove causality. At a minimum, our results should be verified at another institution. Second, while taking the courses concurrently may accomplish our objective of improving student performance in Financial Management, it may have a detrimental effect on some of the objectives of the Personal Finance course. Following our recommendation, a student would probably be taking Personal Finance as a junior or senior. This may be too late if the goals of Personal Finance include helping them manage their personal finances wisely during college and avoid overuse of credit card and student loan debt. Third, we cannot say that Personal Finance is the only finance course that when taken concurrently with Financial Management might improve students' performance. As we noted above, another finance course, such as Financial Markets, that is neither a prerequisite for Financial Management nor a course that must follow it, could have the same beneficial effect. We leave the testing of that conjecture to future research.

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Notes

- 1 <http://money.usnews.com/careers/best-jobs/rankings/best-business-jobs> accessed on March 5, 2013.
- 2 http://nces.ed.gov/programs/digest/d11/tables/dt11_290.asp accessed on March 5, 2013.
- 3 A term used to indicate that students have not attended any other post-secondary institution and have enrolled as full-time students. It does not indicate that a student is the first in his or her family to attend college.
- 4 Chen and Volpe (1998) find that non-business majors, women, students in the lower class ranks, under age 30, and with little work experience have lower levels of financial knowledge.
- 5 <http://www.ecu.edu/cs-acad/ugcat/CoursesF.cfm#fina> accessed on February 11, 2013.
- 6 Spector and Mazzeo (1980), Becker (1983), and Borg, Mason, and Shapiro (1989) suggest that ordered-probit may be a more appropriate regression technique than OLS, given the discrete nature of the dependent variable. In SPSS, the Ordinal Regression Procedure is used to run ordered-probits. Norusis (2012) includes students' grades as an example of ordinal variables that should be analyzed using ordinal regression.
- 7 Results using Model 4, in which the First and Concurrent dummies are replaced with First-grade and Concurrent-grade (each dummy times the student's grade in Personal Finance coded as 0–4 for F–A), are not shown for brevity. Direction and significance of results are similar to those from Model 1. The coefficient on Concurrent-grade is .269, is significant at the 5% level, and has an odds ratio of 1.209.
- 8 The median of GPA times math SAT score (1,569) is slightly below the median GPA (2.918) times the median math SAT score (540), or 1,573.

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