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Is It Still an Econ Course? The Effect of a Standardized Personal Finance Test on the Learning of Economics

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Abstract

We study the implications of mixing economics and personal finance standards in a high school course. Using administrative, survey, and testing data on college students, we find evidence that personal finance instruction crowds out economics instruction. We find that students who received more instruction in economics score almost 5% higher on an economics test. Furthermore, we estimate the effect of being assigned a certification test in personal finance as a part of this course. The effect of the certification test is not uniform across students. The test reduces the economics scores of students with an SAT score one standard deviation above the mean by 5 percentage points, but increases the scores of students with SAT scores one standard

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[†]The views expressed here are those of the authors and not necessarily those of the Federal Reserve Bank of Richmond or the Federal Reserve System.

deviation below the mean by 10 percentage points. Our results emphasize the potentially idiosyncratic effects of mixing economics with personal finance.

1 Introduction

High school students in the United States are increasingly likely to take a required course that includes instruction in both economics and personal finance. From 2018 to 2020, four more states in the United States required a personal finance course for graduation, according to the 2020 Survey of the States from the Council for Economic Education (2018; 2020), bringing the total number up to twenty-one, while twenty-five states required an economics course. Six states (Arizona, Georgia, Michigan, New Hampshire, New York, and North Dakota) reported mixing personal finance into their economics courses (CEE, 2020), while Arkansas, Florida, Idaho, New Mexico, North Carolina, Texas, and Virginia similarly mix the two subjects in their standards for economics courses. This list includes three of the top four most populous states in the United States. Therefore, a mandatory high school course featuring economics alongside personal finance is an increasingly common, though not a universal phenomenon.

Is mixing this content into one course good for student learning? The answer is not obvious. On the one hand, economics and personal finance knowledge seem intuitively to support one another. As the introduction to Virginia’s Economics and Personal Finance course describes it, “Students need a strong, interdisciplinary foundation in economics and personal finance to function effectively as consumers, workers, savers, investors, entrepreneurs, and active citizens” (VDOE, 2019). On the other hand, several studies have shown that students learn economics better in a dedicated course (Walstad and Watts, 1985; Martin and Bender, 1985; Buckles and Freeman, 1984). These studies estimate the effects of infusing economics instruction into other course material. However, they did not investigate the interaction of economics and personal finance in a purpose-built mixed course.

We investigated the effect of personal finance instruction and assessment upon economics learning in a high school “Economics and Personal Finance” (EPF) course. Specifically, we investigate the effects of a high school EPF course on students’ knowledge of

economics by testing them at the beginning of a required college economics course, and also looked at the students' score in the economics course. We also analysed the differences between a course that focuses on personal finance versus one that emphasizes economics. We used data on student characteristics obtained from the university and then surveyed students about their experience in their EPF course in high school, including whether they were assigned a personal finance certification test. Students take this test based on an agreement between their school district and the Wise nonprofit, a personal finance advocacy organization. This quasi-random assignment limits selection bias in our sample. This data allowed us to identify the effects of various aspects of student experience in their EPF course and answer the following questions:

1. What is the effect of personal finance instruction on student learning of economics in a high school economics and personal finance course?
2. What is the effect of a standardized personal finance test on the learning of economics?

With the first question, our survey found that three quarters of students who took the EPF course reported that it was “mostly about personal finance.” (If the courses had been taught exactly according to the state standards, no students should have selected this answer.) We found that students who reported receiving an entire semester of economics instruction in high school (as opposed to mostly learning personal finance) received higher grades on an economics test which was given on the first day of their college economics course. There was some evidence that learning high school economics from a teacher that had 40+ professional development hours in teaching economics had a positive effect on one's final grade in a college economics course.

For the second question, around three quarters of students who took an EPF course reported being assigned a standardized test in personal finance (an assignment decision made at the school district level). These simple results give some reason to believe that yes, personal finance instruction crowds out economics instruction. However, among those who were assigned a personal finance certification test, we also found that students with lower SAT scores actually improved their economics scores, while their higher SAT peers reduced their economics scores.

We consider possible reasons for these idiosyncratic results that may inform educational policymaking, course design, and classroom instruction.

2 Literature Review

Researchers have long emphasized the importance of economic education for students (VanFossen, 2011), and studies of high school economics courses have tried to estimate the effect of high school economics instruction on college economics outcomes, an approach that we continue here.¹ Specifically, early studies by Reid (1983) and Palmer et al. (1979) cast doubt on the lasting value of high school economics instruction, while studies by Brasfield et al. (1993) and Lopus (1997) showed effects that last into and through college courses. A review of the literature in economic education led Watts (2005) to conclude that “a formal secondary course in economics is the safest way to improve students’ knowledge of economics, but it is far from clear that one course in economics is enough to consider students economically literate.”

Running contrary to the idea of a course solely devoted to economics, Morton (2006) suggested that economics can provide “a home” for personal finance education. Similarly, the Financial Literacy Education Commission’s Commission (2006) inaugural national strategy document specifically recommended embedding personal finance instruction in an economics course if a standalone course is not possible. According to the Council for Economic Education’s biannual Survey of the States (2018; 2020), the number of states that require personal finance content standards, or a high school personal finance course, or that at least require schools to offer a personal finance course has been slowly but steadily increasing since the first survey conducted in 1998. Sometimes, these requirements are a part of a course with economics standards. For example, in 2011 Virginia mandated a two-semester EPF course for students entering ninth grade, meaning that the vast majority of students in Virginia public colleges and universities should now have a background in these content areas. North Carolina passed a mandate for a similar course in 2019.

¹Note that both qualitative (Schug and Birkey, 1985; Suiter and Meszaros, 2005) and quantitative (Sosin et al., 1997) studies suggest that even K-12 students can develop economic reasoning and improved money-sense (Chizmar and Halinski, 1983), particularly when taught by teachers trained in such concepts.

Few studies have investigated the interplay of personal finance and economic education per se. Several studies analyzing either economics or personal finance education have mentioned the effects of one on the other in a more incidental fashion, with the two subjects tending to complement each other in a minor way (Walstad et al., 2010; Walstad and Buckles, 2008; Hill and Asarta, 2016). Swinton et al. (2007) found that the students of high school teachers who took a one-day professional development workshop in personal finance education scored slightly higher in economics end-of-course tests. Alternatively, Soper and Walstad (1988) found evidence that students taking a course in "consumer economics" learned less than students taking a dedicated economics course. While these studies may look at the efficacy of teaching economics via personal finance, they have not considered situations where personal finance and economics are supposed to share space in one course, which we emphasize here.

One way to investigate this interplay is by studying the effect of a national, standardized (though not state mandated) personal finance test in a shared economics and personal finance course. Such a test is administered by W!se, a national nonprofit that promotes personal finance education. This organization offers a financial literacy certification to students, which is a "credential awarded to students who pass the test. The credential demonstrates to colleges and employers that students have the knowledge and skills to be financially savvy" (W!se, 2020a). The impact of this test on classroom instruction is not trivial: the W!se website claims that 6 million instructional hours are dedicated each year to prepare for the test (W!se, 2020b). The organization administers its test to approximately 400 schools in Virginia alone (personal communication, July 2020) out of a total of 623. Based on other recent studies showing the potential efficacy of personal finance education, it is reasonable to assume that the score gains that students exhibit on the W!se test may correspond to real increases in classroom learning about personal finance (Kaiser and Menkhoff, 2017; Kaiser et al., 2020).

In this study, we explore the relationship of economics and personal finance in a two-semester high school course that has an equal number of standards, and, theoretically, equal classroom instructional time (one semester for economics and one for personal finance). By focusing on the effect of a standardized test on curriculum, we followed a rich literature and a mixed history. First, there is evidence that a standardized test can do

exactly what it is designed to do: increase student knowledge in the targeted area. For example, there was rapid increase in math scores for both Black and Latino students in the first few years of the No Child Left Behind testing regime (Hansen et al., 2018).

However, standardized testing comes with trade-offs. Scholars have noted that with testing also comes “curriculum narrowing.” This is when “teachers exclude from their lesson plans the material that is not tested in an attempt to maximize the learning opportunity for students on the content of the test” (King and Zucker, 2005). Hess and Brigham (2000) noted that standardized assessments “are not meant to suggest that only what is on the test is important, but many schools have interpreted them this way.” Crocco and Costigan (2007) observed that this was an especially strong tendency in social studies classrooms where standardized testing was particularly prescribed and high-stakes. Data from the nationwide NAEP test showed that there was less attention was devoted to social studies instruction in areas where high-stakes testing was salient (Fitchett and Heafner, 2010; Heafner and Fitchett, 2012; Hansen et al., 2018). VanFossen (2005) demonstrated that a subject area can be marginalized under certain conditions, especially where standardized tests are high-stakes. The presence of a relatively high-stakes personal finance certification test in a classroom is likely to have a similar effect on classroom instruction as do other standardized tests.

Of course, such a test is not a part of all classrooms that include both economics and personal finance. But there is still reason to believe that personal finance might play an outside role in such a course. This is because of the crucial role of teachers in making curricular decisions (Thornton, 2005). Teachers may find that economics content is difficult to learn how to teach. Several studies have shown that a teacher must take three or four economics courses before the added knowledge turns up in student test scores (Allgood and Walstad, 1999; Walstad and Watts, 2015). Additionally, teachers may be more compelled by the apparent practical benefits of personal finance content.

3 Data

Our data was gathered from college students at Virginia Commonwealth University who took an introductory level course in economics between spring 2019 and spring 2020.² These students were from diverse backgrounds and are not necessarily majoring in economics. There were students from the School of Business, the College of Humanities and Sciences, the School of Education, and several other departments across the university. Using one's own students to study the effects of economics instruction is conventional for this type of study, as described by Myatt and Waddell (1990) and Brasfield et al. (1993).

We delivered a twenty-question pretest on the first day of course. These questions were taken from the Test of Economic Literacy (TEL) by the Council for Economic Education (Walstad et al., 2001). The TEL was created to assess high school-level economic understanding, and it is commonly used in the literature for the same purpose as in this paper (Gleason and Van Scyoc, 1995; Koshal et al., 2008; Grimes et al., 2010). Studies on the learning of economics and personal finance have used questions drawn from standardized tests rather than using the entire test (Harter and Harter, 2009; Walstad et al., 2010). This is a technique to increase participants' motivation to respond in the school context, where teachers and students are often tired of too many tests. We did not offer the students a post-test for a similar reason; we did not want to over-test them. We use the word "pretest" to emphasize that the test was taken before they got any college economics instruction, and to differentiate it from the Wise test.

We also estimated the effect of our independent variables on students' final college course grade, an approach that follows previous studies on the effect of high school economics (Myatt and Waddell, 1990; Lopus and Maxwell, 1994). Though this does not qualify as panel data or allow measurement of achievement over time, but it did allow us to look at the data using two different dependent variables, and to see if experiences from high school had an effect further into the future.

Every student present during the first course took the test, since completing it earned them participation points, and was done in class. We also obtained IRB authorization for this study, including access to administrative data on each student. The variables we collect

²Either Introduction to Economics or Principles of Microeconomics.

from the university are: gender, ethnicity, first generation college student, SAT score, and high school GPA.

In addition to the test, we delivered a voluntary survey (appendix B) regarding their EPF high school course. The questions were formulated to be extremely straightforward: whether they were assigned the Wise test, whether their course was mostly about personal finance or if it split equal time with economics, whether they took the course online or in-person, and what their high school EPF's teacher's name was. This last item was cross-referenced against VCEE's database of professional development attendees to determine which students had VCEE-trained teachers. The survey had a high take-up rate, with 83.8% student completion. The group of students who completed the survey was statistically similar to our entire sample, an indication that response bias did not unduly distort our results (see appendix A).

Since not all high school students will go to college and take an economics course, the benefits of the economics instruction (which we found to be significant prior to the course as measured by the pretest scores) may be manifested among the students who stopped their economics education at high school. Unfortunately, our data set only contained students who went to college and took economics, so we were unable to observe whether the instruction would, or would not, impact students outside their classroom.

3.1 Summary Statistics

Table 2 shows some relevant statistics for the students in our sample (to see all the variables we collected, refer to appendix ??).

The test average was 56%, the average final course grade was 78%, the average SAT was 1141 in 1600-point scale, the and average high school GPA was 3.52. Female students were the majority, comprising 57% of our sample, while White, Black, and Latino students represented 41%, 21%, and 14% of the sample, respectively. Almost a third were first-generation in college, and international students comprise a small share, only 2%.

Among students who completed the survey, 73% reported taking the Wise test in high school, and 89% reported taking an EPF course (Table 3). It is safe to say that the majority of Virginia students who take the EPF course take a mandated personal finance test.

Table 1: Summary Statistics

Variable	Mean
Pretest score	0.56
Final grade	78.31
SAT (1600 pt scale)	1141.04
HS GPA	3.52
Female	0.57
Black	0.21
White	0.41
Latino	0.14
International	0.02
First generation	0.31
Survey	0.84
W!se	0.73
EPF	0.89
EPF online	0.20
Teacher trained by VCEE	0.26

Table 2: Grade Average

Variable	Grade
Pretest score	56%
Final course grade	78%
SAT (1600 pt scale)	1141

Table 3: Participation Rate

Variable	Share (%)
Survey	84
EPF course	89
W!se test	73

As evidence of personal finance crowding out economics teaching, we found that 68.3% of students who took an EPF course in high school reported that their course was “mostly personal finance,” and just 28.9% said they were taught an even blend of economics and personal finance, as delineated in the state standards (Table 4).

Table 4: Test scores among students who took an EPF course

Course type	Share (%)	pretest (%)
Mostly personal finance	68.3	54.9
Economics for a semester	28.9	58.7
Other	2.8	56.9

Pretest performance varied depending on the type of EPF course taken, with students scoring higher if they had a whole semester of economics instruction. This difference can indicate that more economics instruction leads to better learning of economics. In the following sections, we control for other variables to see if this result still holds.³

We also observed that a lower share of White students (68%) took the personal finance certification test than non-white(76%), as shown in Table 5. There are also relatively more First-generation college students taking the test than non-First-generation students.

Table 5: Share of Students taking the Wise test

Demographics	Share
White	0.68
Asian	0.78
Black/African American	0.76
Hispanic/Latino	0.76
Two or More Races	0.87
International	0.25
Female	0.74
Male	0.72
First-generation	0.77
Multigeneration	0.71

³This difference is significant in a 95% confidence interval (see appendix A).

4 Methodology

To answer our research question on whether personal finance instruction crowds out student learning in economics, we regressed the pretest score on the EPF course experience (amount of economics studied) and W!se test-taking while controlling for demographic differences and ability. We hypothesize that the presence of a mandated personal finance industry certification test will decrease time spent on economics instruction, with a downward pressure on economics achievement.

In our survey, in addition to asking whether a student took a personal finance certification test, we asked about the focus on personal finance and economics in the high school course. As Soper and Walstad (1988) argue, a course with a focus on personal finance may have a negative impact on the learning of economics and therefore a lower test grade.

The regression model we used is as follows:

$$X_i = \beta_0 + \beta_1 D_i + \beta_2 H_i + \beta_3 EPF_i + \beta_4 W!se_i + \beta_5 A_i + \epsilon_i \quad (1)$$

where X is the pretest score. D are control variables for relevant demographic characteristics like gender, race/ethnicity, and first-generation college status. H is the ability variable represented by the SAT score. EPF is the dummy variable for taking an EPF course with a full semester of economics, and $W!se$ is the dummy for taking the personal finance certification test. Both variables are reported by students in the survey. A represents additional controls, namely teacher's training (names were cross-referenced to state database on teacher professional development), course delivery method (online vs. in-person). We used robust standard errors to correct for heteroskedasticity.

Furthermore, we investigated whether there is an interrelation between our main control variable – SAT score – and our main variable on student experience – W!se testing. We therefore added an interaction term between W!se test and SAT. This is represented in equation (2). We also looked into the interaction between SAT and taking a full semester of economics but did not find a significant effect.

$$X_i = \alpha_0 + \alpha_1 D_i + \alpha_2 H_i + \alpha_3 EPF_i + \alpha_4 W!se_i + \alpha_5 A_i + \alpha_6 W!se_i \times H_i + \xi_i \quad (2)$$

We also looked into the impact of these variables on the final course grade, F , using the same model (3), as well as the impact of the pretest score (4). Demographic variables and SAT scores are expected to affect final course grade, and we wanted to know if the EPF course and the personal finance certification test have any observable effect beyond these. We also controlled for high school GPA, which can affect course grades, as well as the students' professor. Results can be found in the next section.

$$F_i = \gamma_0 + \gamma_1 D_i + \gamma_2 H_i + \gamma_3 EPF_i + \gamma_4 W!se_i + \gamma_5 A_i + \gamma_6 GPA + \eta_i \quad (3)$$

$$F_i = \delta_0 + \delta_1 D_i + \delta_2 H_i + \delta_3 X_i + \zeta_i \quad (4)$$

5 Results

In this section, we present the results of the model specifications discussed above. Table 6 shows the coefficients for the model described in equation (1) ⁴. We controlled for gender, race, first-generation college status, and SAT score. We found that taking an EPF course with a full semester of economics, versus a focus on personal finance or no course, significantly increases student's pretest scores. These students scored 1 point higher out of 20 – 5 percentage points higher – in their tests. Taking the EPF course with a teacher who was trained by VCEE did not impact the pretest result, nor did taking the course online – a popular option, as 38% took the EPF course online.⁵

Taking the W!se certification did not have a significant effect on the test scores, counter to our hypothesis. However, as we can see in the third column of Table 6, students with high SAT scores are negatively impacted by taking the certification, while students with low SAT scores benefited from it. Those two forces cancel out, so we only find an effect in the population once we include the interaction between W!se and SAT.

Figure 1 depicts the predictive margins of W!se for different SAT scores. For a student with a quite low 850 SAT score, taking the W!se test would increase their pretest score by about 3 points out of 20 (15 percentage points). For a student with a high SAT score

⁴To see the coefficients of every variable refer to appendix ??.

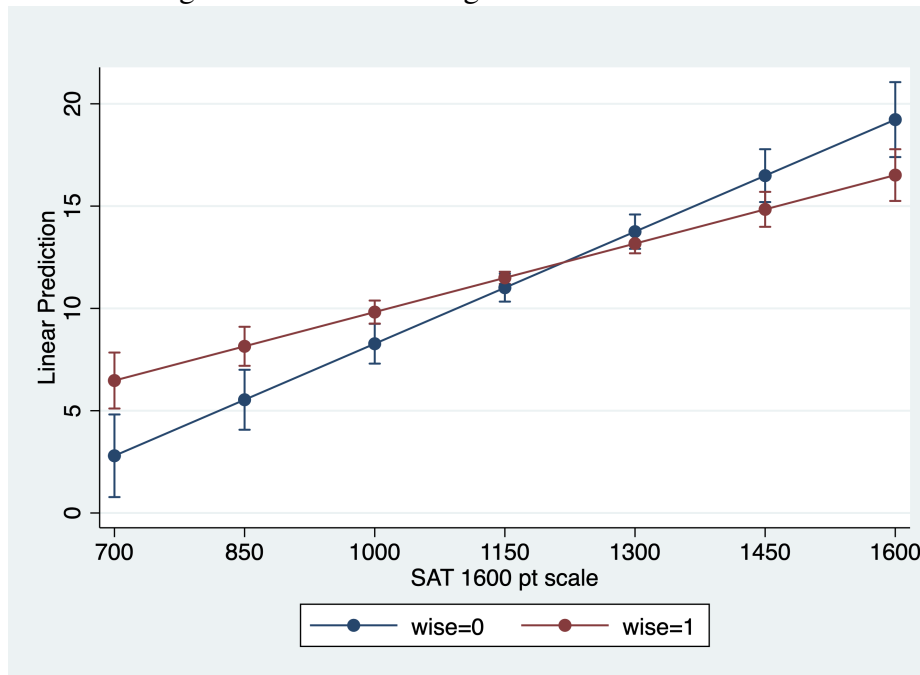
⁵This is all before the coronavirus pandemic.

Table 6: Regressions on pretest score (20 points)

Female	-0.933** (0.291)	-0.942** (0.355)	-0.923** (0.288)
White	1.022** (0.334)	1.167** (0.402)	0.953** (0.333)
Black	-0.382 (0.379)	-0.631 (0.475)	-0.373 (0.379)
First-generation College	0.264 (0.315)	0.517 (0.381)	0.265 (0.313)
SAT	0.013*** (0.001)	0.011*** (0.001)	0.018*** (0.002)
EPF (semester of econ)	0.920** (0.315)	0.991** (0.376)	0.926** (0.313)
W!se	0.431 (0.392)	0.276 (0.577)	8.647** (2.879)
Trained by VCEE		-0.123 (0.361)	
Online		-0.212 (0.496)	
W!se \times SAT			-0.007** (0.002)
Observations	342	217	342
R^2	0.322	0.318	0.334

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Figure 1: Predictive margins of wise with 95% CI



of 1450, taking the W!se reduces their pretest score by about 2 points (10 percentage points).⁶ The average student in our sample had an SAT score of 1141, and would increase their score about 5 percentage points by taking the W!se. A student with a SAT score one standard deviation above the average would decrease their pretest score by about 5 percentage points by taking the W!se test, while a student with a SAT score one standard deviation below the average would increase their pretest score by about 10 percentage points by taking the test. For comparison, we found that taking the EPF course with a full semester of economics instruction increased one's pretest score by about 1 point, or 5 percentage points. These differing effects of the certification test are not trivial—they have the largest effect size of any variable we studied besides SAT score itself.

The last part of our analysis examined the effects of these variables on students' final grades in their college economics course, following the model in equations (3) and (4). The results can be found in Table 7. These results are subject to perhaps competing effects. On

⁶The 850 and 1450 are close to minimum and maximum SAT scores in our sample, which are 820 and 1500, respectively.

one hand, entering the course with some knowledge of economics learned in high school may allow students to learn more and perform better at their college course. On the other hand, good college instructors can teach the same material and fill any gap in students' knowledge from differences in their high school education.

Table 7: Regressions on final course grade (100 points)

Female	2.05 (1.14)	1.48 (1.28)	2.96 (1.57)	0.59 (1.53)
White	-1.57 (1.27)	-2.20 (1.44)	-2.12 (1.80)	-1.92 (1.69)
Black	-1.79 (1.46)	-2.02 (1.61)	-3.26 (1.96)	-3.53 (1.93)
First-generation College	1.68 (1.17)	2.48 (1.32)	2.20 (1.55)	1.86 (1.50)
SAT	0.04*** (0.01)	0.04*** (0.01)	0.03*** (0.01)	0.03*** (0.01)
EPF (semester of econ)		-0.42 (1.54)	1.16 (1.74)	0.30 (1.61)
Trained by VCEE			3.70* (1.66)	2.48 (1.61)
White				-1.35 (2.72)
Online				1.65 (2.30)
HS GPA				7.30*** (1.92)
Observations	388	315	200	198
R^2	0.147	0.150	0.172	0.243

Standard errors in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

We find that students' final grades are determined mostly by SAT and high school GPA. A 100-point increase in SAT score was associated with a 2.73 percentage point increase in final grade. High school GPA had a significant effect, with a half-point increase in high school GPA (e.g., from 3 to 3.5) being associated with an increase in final grade of 3.58. Students whose teachers were trained by VCEE scored overall 3.7 percentage point higher than their peers, which was significant with a p-value of 0.03 when not controlling for high school GPA. However, when high school GPA was included in the model, the effect of VCEE training was rendered no longer significant, with a p-value of 0.073. Unlike the pretest analysis, students who spent at least half their high school EPF course studying

economics did not get higher grades, showing that the EPF effect did not persist after the college experience.

A further analysis, developed in Table 8, shows the results of a logistic regression on drop outs. In column (1), we can see that students with a higher pretest score are less likely to drop-out from the course. However, this effect disappears once we control for SAT and high school GPA.

Table 8: Logistic regression on non-drop outs

	(1)	(2)	(3)
	final	final	final
pretest	1.20*** (0.02)	1.06 (0.08)	1.06 (0.07)
SAT		1.00* (0.00)	1.00* (0.00)
HS_GPA			4.42*** (1.66)
<i>N</i>	629	422	422

Odds ratio; Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Previous studies are similarly ambivalent about the persistence of high school economics study on college achievement. Lopus and Maxwell (1994) and Lopus (1997) found that economics learning can persist, but only in regard to certain economics content. Brasfield et al. (1993) reported that results on this question are often "inconclusive and often contradictory," though they did find positive results for high school learning, while emphasizing that effects may vary depending on statistical methods and local context. As for whether or not students drop the course, it is not surprising that "students' grades in their economics courses are a significant predictor of course persistence for both men and women" (Ahlstrom and Asarta, 2019), and that test scores and high school grades are associated with college performance.

6 Discussion

In this study, we measured economics achievement by a course pretest as well as final grade in an introductory college economics course. Several aspects of a high school course in economics and personal finance become apparent.

A large majority of students taking a mandated course in economics and personal finance in Virginia take a required personal finance standardized test. A full 70% of all the students who took an EPF course reported that it was mostly about personal finance. This is strikingly close to the 73% of students who reported taking the W!se test, and this is further corroborated by the proportion of schools that W!se works with in Virginia: 400 out of 623, or 64%. (One expects that larger public schools are more likely to use the test than private or smaller schools, meaning that the proportion of schools that use the test should be somewhat lower than the proportion of students who take the test.) This is strong evidence that personal finance instruction did crowd out economics instruction. However, the personal finance test was not associated with lower economics test scores for all students. Low SAT students actually performed better in our economics pretest if they have taken the W!se test, while high SAT students performed worse.

There could be several explanations for this. One possible explanation is that economics and personal finance complement each other. For example, learning about interest rates in personal finance would help also one prepare for the economics test. Evidence for this explanation was found by Walstad et al. (2010) in a study of student learning gains from a high school personal finance curriculum where students who were in economics courses scored higher in personal finance than those who were not. In another study by Grimes et al. (2010), a large nationwide telephone survey found that adults who reported taking high school courses in economics were less likely to be unbanked, and people with more knowledge of basic economic concepts were similarly unlikely to be unbanked. The authors' findings demonstrated that "an individual's understanding of the economic system was as important as formal coursework in explaining access to basic financial services."

The need to substitute time learning personal finance in place of other courses (perhaps in some cases Advanced Placement economics) may explain the decrease in economics scores for high-SAT students. This supposed substitution effect is apparently

strong enough to overturn the complementary effect of economics and personal finance in these students. Whatever the explanation, this finding should be particularly important for policymakers, school district administrators, and classroom teachers. A good policy should consider the composition of the classroom. More research is needed for us to have a better understanding of the certification requirement outside the classroom.

The effect of being taught economics for a full semester in high school, while significant to the pretest, was not significant for final grades. This is not entirely surprising, as previous studies have found that previous advantages in economics learning can fade away as current students catch up (Myatt and Waddell, 1990). However, students who had a high school teacher who did at least 40 hours of teacher professional development from VCEE in economics education earned about 3.5% more on their final grades than their peers. This is admittedly a model-dependent result that is much narrower than when the students in the sample had no uniform economics experience. Earlier studies show that teachers need between three and four economics classes before their learning translates into student learning (Allgood and Walstad, 1999; Swinton et al., 2010), and that student gains may be associated with learning certain economic concepts rather than others (i.e., micro rather than macro) Lopus (1997). In addition, it is encouraging to note that whatever disadvantages female students exhibited in the pretest were not present in their final grades. Latino students fared especially well in their final grades.

This study has some limitations. The subjects were drawn from courses during three semesters, at one state university, so it is possible that these data do not reflect the achievement or experience of the wider population. The lack of a true post-test (in contrast to our analysis of final grades) does not allow us to track student growth over time - we have to be content with these "snapshots" of achievement. Much of the study relies on survey responses to at least some degree. We sought to mitigate the problems associated with incorrect survey responses or forgetfulness by asking very broad questions (e.g., Did you take the financial literacy certification test?) and by asking several different questions to try to parse out the relevant phenomena. The variable for teacher's training was sparse given that several students forgot the name of their teacher. Also, the last semester in our data had a shift in instruction mode once all courses had to be online due to the coronavirus pandemic, so final grades for that semester may be different than for a regular semester.

Our results provide valuable insight into the relationship between economics and personal finance subjects in high school, which are likely to be crammed together in one course. If more states move toward mandates for EPF courses, they will want to be apprised of the tendency of personal finance content to dominate economics content. This paper has demonstrated that this tendency does not necessarily negatively affect economics scores—at least for some students—especially if economics is emphasized or at least given parity in the classroom.

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A Robustness Checks

Table 9: Summary Statistics by Survey Take-up: **Mean**

Survey	Pretest	Final Grade	SAT	HS GPA	female	white	firstgen
No	56.00	77.46	1113.50	3.44	0.54	0.34	0.32
Yes	56.05	78.47	1147.49	3.54	0.57	0.42	0.31
Total	56.05	78.31	1141.04	3.52	0.57	0.41	0.31

Table 10: Summary Statistics by Final Exam Attendance: **Mean**

Final Exam	Pretest	SAT	HS GPA	female	white	firstgen
No	58.20	1189.41	3.45	0.52	0.46	0.31
Yes	55.75	1136.80	3.53	0.57	0.40	0.31
Total	56.05	1141.04	3.52	0.57	0.41	0.31

Table 11: T-Test: Difference in pre-test score between groups

	(1) No Survey vs. Survey	(2) No Final vs. Final	(3) Mostly PF vs. Mostly Econ
pretest	-0.01 (0.971)	0.49 (0.235)	-0.72* (0.022)
<i>N</i>	629	629	527

p-values in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

B Survey: The Effect of High School Economics courses in Virginia

Name _____

1. When did you last take an economics class (high school or college?)
 - (a) Never
 - (b) Last semester
 - (c) Last year
 - (d) Before last year

2. Have you taken a high school economics and/or personal finance (EPF) course?
 - (a) No.
 - (b) Yes. The course was mostly about personal finance
 - (c) Yes. I learned about economics for an entire semester
 - (d) Yes: another course (what was the course?)

3. What grade did you get in that EPF class?
 - (a) A
 - (b) B
 - (c) C
 - (d) D-F
 - (e) Not applicable

4. In which school division (county) did you take your class? [Private or charter schools write "other"]

5. Did you take the W!SE personal finance certification test as part of your high school EPF class?

(a) No or not applicable

(b) Yes

6. How was the EPF course delivered?

(a) With a classroom teacher

(b) Online, with lots of involvement from a classroom teacher

(c) Online, with little teacher involvement

(d) Not applicable

7. What was your most recent high school economics teacher's name (full name)?
