CARNEGIE CLASSIFICATION,

GENDER, AND TIME ALLOCATION:

INSIGHTS FROM A SIXTH NATIONAL

QUINQUENNIAL SURVEY OF ACADEMIC ECONOMISTS

by

Joshua D. Dalton

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Economic Education

Summer 2023

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ACKNOWLEDGMENTS

I have a long list of people without whom I would not be here. First, I would like to thank my advisor Carlos Asarta. Between the MAEEE program and this Ph.D., he has spent the last eight years encouraging me, fostering my growth, opening doors of opportunity, and extending tremendous patience. He believed in my potential when others did not. I owe him a great debt.

I also want to thank Dr. Bonnie Meszaros, Dr. Robert Hampel, and Dr. Cynthia Harter for graciously serving on my dissertation committee. Drs. Meszaros and Hampel are about to retire, and Dr. Harter does not teach at the University of Delaware. Yet each of them has given of their time, and that investment in my future has meant a great deal to me.

Thank you to Dr. Jim O'Neill for his work to develop the MAEEE program and Economic Education Ph.D. long before I even knew what an indifference curve was.

Thank you to my professors in the University of Delaware Economics and Education Departments. Professor Butkiewicz deserves special thanks for writing me a letter of recommendation to this program and for giving of his time to an Economic Education guy trying to learn as much as he could about monetary theory. Professor Black deserves special thanks for showing patience and grace as I climbed a steep microeconomic theory learning curve. Professor Hampel deserves special thanks for always being in my corner and helping me to become a better teacher.

Thank you also to Professor Schubert. Despite my never taking a class with him, he was an ally, an encourager, and a guide as I transitioned to teaching at the collegiate level. Thank you to Professor Gerry Swanson for deepening my love of economics and for helping me see that this field was one I could call home.

To Barbara Gray for being one of the first people to believe in me, and the Thomas R. Brown Foundation for their early and frequent investments in my progress.

To Torky, Professor Gorbachev, Sam Cogar, and Navid Mirzaei for helping me shore up the mathematics and econometrics understanding I missed out on by teaching English for 20 years.

To Karen Yanes for on a fateful morning saying, “Well, I’ve always thought you should go get a Ph.D.”

To Al Nielsen who was the best boss I ever had and assigned me the task of teaching Government, which ended up being the pathway to my love of economics.

To John O’Hair, who taught me my first economics content and equipped me with the ideas that shaped my philosophy of education.

To Nikolai for his endless encouragement about my potential, wisdom for navigating this journey, and many hours of reading drafts and offering feedback.

To my friends in Tucson, particularly Dan Young who shared my first FTE program with me and would let me drag him to TRBF workshops. Dan Hartman and his exultant expletive when I told him I had been accepted into this program, the memory of which helped me push through some of the tougher moments of the past 5 years. Dan Gibson who has always had my back and always believed I could do big things. Peter Gentala who somehow had the maturity at 17 to call me out on my ideological arrogance and lay a foundation for a humility without which this would not have been possible. And Jared Perkins who showed me getting an advanced degree at a relatively advanced age was doable.

To my sister Joanna who got the first master's degree in our family and has been my cheerleader since I first started thinking about pursuing graduate work.

To my mom who has been excited for me even though pursuing this degree meant moving away from Tucson. And my dad for always checking on me, particularly in the final stages of writing this dissertation.

To Ke$ha for in a way setting this whole journey in motion.

I could go on. Classmates, office moms, new friends met only because of our move to this part of the world. Thank you to you all.

Most important, I want to acknowledge my bride Cristina and our girls. The four of you made an unquantifiable sacrifice for my dream of teaching economics at the collegiate level. Cristina, thank you for coming on this journey with me. I know it has been hard, and you have been a trooper and a rock. I believe the best parts of the adventure lie ahead. I love you.

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ABSTRACT

This dissertation analyzes data from the sixth national quinquennial survey on teaching and assessment methods in undergraduate economics. Findings are presented in three essay chapters. The first study explores the ways schools of differing Carnegie Classifications teach and assess economics. Findings support previous research, both in economics and the academy more broadly, that reveals that although Carnegie Classification itself may not have much explanatory power for differences in teaching and assessment methods, meaningful differences do exist. Findings also show that instructional and assessment methods previously identified in the literature as catalysts for student learning and engagement are less likely to be used at Doctoral institutions.

The second study analyzes the impact of professor gender on choices of instruction and assessment methods. Findings support previous research on demographic characteristics more generally while also suggesting that professor gender is the strongest predictor of methodological variety. More specifically, results show that female faculty are more likely than their male colleagues to employ strategies involving verbal skills, writing, interaction, and cooperation.

The third study examines the determinants of the actual and preferred time allocations by academic economists. Findings differ from previous time allocation work, showing that female faculty no longer exhibit a clear and statistically significant preference for teaching, though they do still exhibit a preference away from research. Analysis reveals that rank is a far better predictor of actual and preferred time allocation to teaching and research. Results also suggest that promotion and tenure incentives do not have much impact on either actual or preferred time allocation.

Chapter 1

INTRODUCTION

1.1 Overview of the State of Economics Instruction and Assessment at the Collegiate Level

In 1995 William E. Becker and Michael Watts published an article entitled "Teaching Tools: Teaching Methods in Undergraduate Economics." The article concluded with an observation that economists have a reputation for not caring about their teaching. Becker and Watts followed this observation with their own conviction that this was not the case, and an admission that they had only anecdotal evidence to refute that idea. Looking back, one can see in that article the seeds of what would eventually become the quinquennial survey. That same year, Becker and Watts administered the first iteration of the survey, and their first examination of that data came a year later. Disappointing Becker and Watt's hopes, the picture was not flattering. The economists devoting time and effort to improving their teaching methods were a minority in the profession. Assessment was homogeneous, as were the demographics of the profession. And instruction methods were stagnant. Thus began a now-decades-long mission of helping academic economists to right the ship.

The first quinquennial survey appeared against the backdrop of falling numbers of undergraduate economics degrees. In the years following, enrollments and majors rose, but then leveled off in the first decade of the new millennium (Siegfried, 2013). That plateau in the number of economics degrees has ended. Siegfried's most recent analysis of trends in undergraduate economics degrees finds that from 2001 through to 2020, the number of economics bachelor's degrees has risen 86%. The accompanying 60% overall increase of bachelor's degrees means the proportion of economics degrees has risen as well. To offer some perspective for these numbers, economics majors are still less than 10% of business school majors (National Center for Education Statistics), and the proportion has been more or less flat over at least the last ten years. Also, as of 2015, the number of economics degrees was less than those in other social science fields of political science, history, and sociology, but more than other highly quantitative fields of physics, chemistry, or math and statistics (Allgood, Walstad, & Siegfried 2015).

One might ask, if enrollments are not falling, then why does something like the quinquennial survey matter anymore? This question ignores three important facts. First, more students in our courses and departments means more students exposed to the economic way of thinking. Second, good teachers and good teaching draw people to the field (Evans, Grimes, & Becker 2012). Trends are rarely permanent and the data for 2020 and 2021 show that enrollments may be trending down again (Chevalier, 2022; Scott & Siegfried, 2021). Finally, the question also relies on the flawed premise that enrollments are all that matter for academic economists. For one thing, our reputation outside of the discipline matters and, as alluded to above, that reputation is not always positive (Allgood, Bosshardt, van der Klauw, & Watts 2004). Second, even in the survey's first iteration Becker and Watts (1996) identified that there was more to this issue than just numbers. To them, lack of innovation and poor instruction were ills in and of themselves (Becker & Watts, 1996) and they implored their colleagues in the field, both then and in the future, to recognize the importance of growing in their craft. In other words, rising enrollments can mask delivery issues, which recent work has found still persist (Asarta, Chambers, & Harter, 2021).

Exploring instruction and assessment methods in economics allows for a set of comparisons. First, are there differences in the way that undergraduate economics is taught and assessed at schools of differing Carnegie Classification? Second, do male and female instructors teach and assess economics differently? Finally, most academic economists allocate the majority of their time to two activities, teaching and research. Therefore, what are the determinants of the way economists allocate their time to these activities, and what are the determinants of way economists would prefer to allocate their time to these activities?

These comparisons lead to questions of the role incentives and rewards, particular for promotion and tenure, could have in changing the choices academic economists make regarding their methods and their time allocation. Allgood and Walstad (2013) suggest that promotion and tenure structures can and do affect the choices academic economists make. If they are correct, then it is possible that department chairs in economics could change incentive structures to decrease the ratio of chalk and talk and increase methodological variety in both instruction and assessment.

1.2 The Current Status Quo

Starting with the first quinquennial survey, Becker and Watts (1996) presented a picture of the typical economics instructor: a Caucasian male who lectures while writing on the board or an overhead projector and assesses learning with multiple choice exams. Use of discussion; cooperative learning; alternative media; and references to sports, literature, drama, and pop culture were virtually nonexistent. This situation led Becker (1997) to wonder if all professors across the academy shirked their obligation to teach students, and to speculate that this might be even worse in economics. Particularly dismaying was his view that his colleagues in the profession had accepted White's (1995) assertion that there is an inverse relationship between rank and the amount of attention a department gives to developing and assessing—and, by extension, rewarding—teaching.

The findings of the first quinquennial survey regarding uniformity of instruction and assessment methods remained mostly unchanged over the next iterations (Becker & Watts 2001; Watts & Becker, 2008; Watts & Schaur, 2011). Further research by Allgood et al. (2015) found that the coursework across economics departments was virtually the same. Based on the most recent quinquennial survey, despite the fact that chalk-and-talk continues to be the dominant form of delivery, the past 15 years have seen some slight changes. Instructors have continued movement away from overheads to PowerPoints, and they have begun incorporating discussion more than past survey respondents. On the assessment side, use of cooperative learning assessments has also grown (Asarta, Chambers, & Harter 2021; Harter, Chambers, & Asarta 2022; and Harter & Asarta, 2022).

Unfortunately, not all economists see the lack of innovation in instruction and assessment methods as a problem. Some even love the reputation economics has. They see economics as the Marine Corps of the academy and equate low enrollments with high standards and an indication that people know that economics has not succumbed to the same softening of standards and expectations the rest of the academy has undergone (McMillan, 2003). Though it is admirable to resist the trends of grade inflation and falling standards (Babcock, 2010), this Marine Corps view reveals deafness to student perspectives and a large body of pedagogical research. In a review of student evaluations of instruction Boex (2000) found that students most value organization and clarity, but this is followed closely by presentation ability. The presentation ability rating included elements of enthusiasm, self-confidence, apparent enjoyment of teaching, being dynamic and energetic, having an interesting style, varying the speed and tone of the voice, and an apparent care for the quality of one's teaching. A 1-point increase in the rating for presentation ability increased the likelihood of receiving a rating of excellent overall effectiveness by 9%. This likelihood was even higher for graduate students. Similarly, Bosshardt and Watts (2001) find that students weight instructor preparation more heavily than instructors do. They add that instructors should not dismiss students' ability to judge preparation, but instead that instructors make it clear to students that they work diligently on their teaching. Reverter, Martinez, Currey, van Bommel, and Hudson (2020) show that overall course rating was most closely related to approachability and encouragement of student input, rather than explanatory skill or level of organization. The different ordering of student priorities notwithstanding, a stereotypical economics instructor detachedly lecturing at the front of a classroom is not exhibiting the traits and instructional methods valued by students.

1.3 Methods Matter

As identified above, methods have an impact on enrollments, and enrollments in undergraduate economics may already have adjusted downward, just as they did in the 1990s. Lombardi, Ramrattan, and Szenberg (2004) saw the decline in the 1990s as at least partially a response to poor teaching. Research by Mumford and Ohland (2011) show that the principles course has provided a major gateway to the economics major.

Approximately one third of their sample decided to major in economics while taking a principles course, and two thirds chose to major in economics after taking the principles course. Another study found that 52% of economics majors chose the major because they "did well in early courses and found it interesting" (Jones, Hoest, Fuld, Manesh, & Colander, 2009). Allgood et al. (2004)—echoing the work by Boex (2000), Bosshardt and Watts (2001) and Reverter et al. (2020)—report that years later students who either took or majored in economics reported not having been all that impressed with how it was taught. Evans et al. (2012), in their survey of eminent economists, find that 53% of them were drawn to economics by the coursework and argue that college instructors have the potential to either attract or repel students.

But enrollments are not the primary reason methods matter. Hoyt (2003) identifies several other important considerations: methods beyond chalk and talk increase learning, attract students, engage students, and impact students' lifelong relationships with economics. She adds, "As economists become better teachers, teaching becomes more fulfilling for economists, and economics becomes more fulfilling for students" (p. 206). Hoyt's observation corresponds to the animating purpose of the quinquennial survey and Becker and Watts' (1995 & 1996) belief in the self-evident inferiority of instructional uniformity and stagnation. Put more simply, students learn more, apply more, retain more, and enjoy economics more when instructors move beyond chalk and talk.

In the interest of defining terms, business-as-usual on this topic comes from the norm Becker and Watts described in 1996: teaching delivered exclusively or almost exclusively through lecture and a professor drawing graphs and equations on an overhead projector or blackboard. Anything else falls under the broad umbrella of alternative instruction methods. That phrase often works interchangeably with active learning. "*Active learning* is generally defined as any instructional method that engages students to do meaningful learning activities and think about what they are doing" (Prince, 2004, p. 223). The degree to which active learning overlaps with, comprises, and is different from other categories such as *collaborative learning*, *cooperative learning*, and *problem-based learning* sometimes depends on the author or particular context (Prince). For the purposes of this dissertation, each of these terms stand collectively in contrast to chalk and talk. Each alternative to direct lecture provides benefits that simply employing chalk and talk does not. One possible explanation of the benefits of alternative instruction and assessment comes from the work of Marton and Säljö (1976), who drew a distinction between surface-level and deep-level processing; in other words, *what* is learned vs. *how much*. This means that for some alternatives, the benefits of methodological variety may not show up on a multiple-choice exam, but that does not make the use of a range of methods irrelevant.

1.3.1 Across College and the Sciences in General

Naturally, alternative instructional modes appear throughout the academy. There is some evidence that they may appear more frequently in other sciences and in finance than they do in economics (Saunders, 2001). Evidence of the effectiveness of alternative methods has existed for decades. Johnson, Johnson, and Smith (1998) present evidence that, despite the fact that cooperative learning shifts the focus from individuals to groups of students, individuals experience greater learning gains than they would otherwise. In an examination of role play simulations in a psychology class, DeNeve and Heppner (1997) find that 91% of students responded positively to the role-playing strategy. They also show a statistically significant improvement in the retention of information as a result, as well as a belief by students that they would retain more because of it. In an analysis of interactive engagement in physics courses, Hake (1998) found that introductory physics courses that made extensive use of interactive engagement saw a post-test achievement difference of two standard deviations over courses that relied almost exclusively on lectures. Beichner et al. (2007) replaced lecture with more collaborative activities in a physics class and students from the treatment group saw normalized gains on posttests that were twice as high as those of their peers. More recently, Haak, HilleRisLambers, Pitre, and Freeman (2011) explored the use of *required* clicker questions and short quizzes (five questions) at the end of each week in a collegiate biology course. They report increased student performance over classes without or with optional active learning. In an examination of the effects of active learning on student anxiety in STEM classes, Cooper, Downing, and Brownell (2018) show that clicker questions and group work have the potential to lessen class anxiety, and in their case that lessening was tied to a student belief that these activities increased learning. Finally, a meta-analysis by Freeman et al. (2014) on 225 active learning studies shows that in STEM courses the use of active learning can increase student exam performance by 0.47 standard deviations over traditional lecture. The continually growing body of research on the benefits of active learning led Bodary and Gross (2018) to declare, "Going forward, we need to encourage innovation in our courses to move away from passive content delivery to enhance student engagement, critical thinking, and real-world problem solving" (p. 326).

1.3.2 In Economics

Focusing first on learning gains, Frank (1997), employing a single classroom experiment in an economics course, found that students who had participated in the experiment scored better on a multiple-choice test item about the corresponding concept than students in a control group. He also adds that his findings could actually be *underestimating* the learning gains due to the way the experiment was isolated from the rest of the course. Emerson and Taylor (2004) explored the use of classroom experiments and saw their treatment group improve their pre- and post-test TUCE scores by three questions more than the control group. Yamarik (2007) found that cooperative learning was positively related to exam scores in an Intermediate Macroeconomics course. Dickie (2007), employing a pre- and post-test model, shows that classroom experiments improve student performance over lecture only. The gains from cooperative and active learning have also led to more widespread use of flipped and blended classrooms, which are built on increased in-class practice, simulations, experiments, and so on. Caviglia-Harris (2016), in a comparison of traditional, partially flipped, and totally flipped classrooms, found that students in both of the flipped environments scored 4–14% higher on a set of common questions and cumulative final exam versus their peers in the traditional format. In an examination of students retaking a microeconomics course for business administration, Abío et al. (2019) used a flipped classroom and teamwork strategies. Their participants showed final exam gains as a result of guided autonomous study, continuous feedback, and teamwork. In another comparison of flipped versus traditional, Singh (2020) showed that students in the flipped classroom performed better on a final exam compared to their peers in the traditional classroom, and that the students in the flipped classroom were almost two times less likely to fail the course. Finally, Asarta and Schmidt

(2017) examine student performance in blended versus traditional courses, while also factoring in students' prior performance. They discovered that students with high prior levels of achievement perform better, middle level students about the same, and low students worse. However, they also note that there are mechanisms available to instructors to increase performance for the low and middle students.

As alluded to above, not all gains from active learning will be tangible. Maier and Keenan (1994) and Moore (1998) provide evidence of increased student satisfaction from active learning. Johnston, James, Lye, and McDonald (2000) explored the outcomes of a collaborative problem-solving program in a second-year macroeconomics course. They found minimal exam improvement as a result of the program, but relate that both students and tutors enjoyed the class more. They also report an increase in class preparation time on the part of students, and point out that replacing a lecture with collaborative work increased student enjoyment and did not leave students less prepared for assessment. They argue this is in itself a gain. Dickie (2007), beyond his findings on learning gains, adds that students could also learn about using experiments to test theories and that students simply enjoy experiments. This increases the chances that students will come away from a course with a positive view of economics. Marburger (2005) provides evidence that even if cooperative learning doesn't affect test scores, it improves deep-level learning, the learning necessary for student application to new contexts. If we want our students to walk away from our classes thinking like economists, then this is the kind of experience we want them to have. Cooperative learning strategies make that more likely. Students in a study by Carter and Emerson (2012) reported high enjoyment of in-class experiments and that the experiments were valuable to their learning. Sierra (2020) similarly reports that students saw simulations as useful learning tools, and that their understanding and political engagement had improved as a result of their participation. Participants in Singh's (2020) examination of flipped classrooms showed higher levels of engagement, more flexibility, and enhanced in-class student-instructor interactions.

1.3.3 Assessment

The role of assessment in the construction of a class, the reputation of the economics discipline, and student learning outcomes cannot be ignored. Instructor choices about assessment methods work hand in hand with choices about content and instruction methods (Walstad, 2001). Unfortunately, the stereotype of economics instructors, especially at the introductory level, relying primarily on multiple choice assessment has not changed. In fact, if anything that reliance has grown, with the weight instructors place on such exams increasing since the 2010 iteration of quinquennial survey (Harter et al., 2022). However, as Walstad (2001) argues, assessment, like instruction, should be considered a multi-dimensional feature of the economics course. “By asking students to speak, to write, or to take a test on economics, the instructor is asking the students to think about economics” (p. 292). He continues by identifying that the higher the quality of an assessment measure, whether graded or ungraded, the more students will think about the course and their learning in it. This idea shows up in the work of Buckles and Siegfried (2006) who introduce the possibility that multiple choice questions will not measure depth of understanding or require students to reason through concepts. They argue that multiple choice questions can measure some in-depth thinking, but not at the highest levels. They also point out that an instructor cannot measure creativity or originality with multiple choice exams. Walstad (2006) adds that essay tests give instructors a more comprehensive picture of student learning, both individually and as a class. The benefits of written response are not limited to exams. Chizmar and Ostrosky (1998) show that the simple and ubiquitous one-minute paper has clear achievement gains for economics. Cartwright and Stepanova (2012) find that if students completed a post-experiment writing assignment, they were far more likely to correctly answer a corresponding test question. Ray (2018) employed a project involving "cases" and showed that when her final exam came around, classes where she included the case project outperformed those where she did not. Finally, McCann (2017) reports that a closely aligned semester-long synthesis of active learning, formal and informal feedback, and report-style coursework allowed for deeper student engagement, meeting of course objectives, diminished incentive to plagiarize, and deeper learning.

Beyond lack of creativity or depth, another common critique of multiple-choice questions is that they are gender biased, or at least offer greater potential for bias. Walstad and Robson (1997), however, show that if biased questions are removed, the score differential can be completely or almost completely eliminated. Related, it would be inaccurate to say that multiple choice assessment cannot be beneficial or meaningful. Despite their identification of the limits of multiple-choice assessment, Buckles and Siegfried (2006) also address the ways in which at least some depth of understanding can be assessed. Rebeck and Asarta (2012), while identifying the shortcomings of multiple-choice exams, argue they are far more objective than free response measures, and that they can measure greater breadth, especially when there are few exams in the semester. In a comparison of multiple choice and equivalent constructed response questions, Chan and Kennedy (2002) report that for some multiple-choice questions, students score better on the multiple choice, even after correcting for guessing. They speculate that the multiple-choice alternatives appear to offer reminders of the material, which for some instructors may be worthwhile assistance to provide during an exam.

1.4 Purpose of the Study, Guiding Questions, and Structure

The methodological inertia mentioned above provides much of the motivation for this study, with the hope that the findings here can act as either a spur or a tool in the hands of those economists and administrators interested in seeing a change in the status quo. In addition, the sometimes contradictory and fraught picture of the gender gap in economics, and the experiences of females in this field, means that any exploration that touches on and informs those topics has the potential to bring about change on those fronts. Finally, the literature on time allocation, especially for economists, is minimal at best. Expanding the research on this question can help departments to maximize the productivity of their faculty. Overall, the purpose is to encourage greater methodological variety either through adjusting incentives or changing departmental cultures.

The approach that will best accomplish this objective is a three-essay study, with an essay chapter devoted to each of the main research questions. The questions that will guide each essay chapter are below.

1) Do instructors at schools of varying Carnegie Classifications teach and assess economics differently?
2) Do men and women teach and assess economics differently?
3) What are the determinants of actual and preferred time allocation for academic economists? Are there significant differences between those two sets of predictors?

The essays will be preceded by an overall literature review and a description of the research methods and strategies. The essays will be followed by a conclusion articulating the common threads, overall policy implications, and opportunities for future research.

1.5 The Stakes

The issue of instruction and assessment methods has ramifications for enrollments, learning, the quality of teaching, the gender gap, and beyond. As Hoyt (2003) argues, what goes on in an economics course will determine the relationship students have with economics over the course of their lives. Along this line, Allgood and Walstad (1999), Walstad and Rebeck (2002), and Allgood et al. (2012) report longitudinal effects of economics courses years after students have taken their classes. Among these effects is an increased likelihood to have policy beliefs closer to those of most economists. Walstad and Rebeck (2002) specifically found that these people are more likely to be optimistic about the economy. Furthermore, Harter et al. (2015) point out that teaching methods can have an impact on the overall intellectual and cognitive quality of college graduates, as well as the choices of college graduates to continue in the field of economics.

In addition to affecting students' lives after they have left the economics classroom, our methods have tremendous potential to affect the gender and diversity gaps in economics. Haak et al. (2011) report that their inclusion of active learning strategies not only increased student learning but also reduced the learning gap. Lage (2000) found that inverting the classroom helped to create an inclusive environment. Algan, Cahuc, and Shleifer (2013) report that “horizontal” teaching methods like students asking teachers questions and working in groups produced more social capital. These findings take on new importance when one considers the poverty alleviation potential of social capital (Islam & Alam, 2018) and the social-capital benefits to first-generation college students (Schwartz et al., 2018). Reaching back several decades, Feiner and Roberts (1995) address the student interest and engagement benefits of teaching critical thinking, specifically regarding topics of race or gender. They also anticipate and address the "That's just bringing political correctness into economics" argument. They identify that insofar as "PC" requires a heterodox position, addressing these issues would be decidedly out of the mainstream content of introductory economics classrooms.

The potential for improving the diversity of our discipline cannot be ignored. However, that diversity is not an end unto itself. Rather, that diversity has the potential to bring about more tangible benefits. First, as will be explained in chapter 5, more women in the field increases the likelihood of methodological variety in instruction and assessment, the benefits of which have been discussed above. Next, previous work has found that women research topics that men traditionally have not; for example, labor, education, and health (Goldin, Guerrieri, & Voena, 2019; Sierminksa & Oaxaca, 2021). This diversity of background has the potential to foster a diversity of perspective as well. The result would be more complete discussions on matters of policy, and more informed decision making. Also, as Allgood, Bosshardt, Van Der Klaauw, and Watts (2011) found, there are financial benefits from economic coursework and an economics degree in the form of higher earnings, savings, and home equity, even in comparison to other business degrees. In addition to instructional, research, and financial benefits, greater diversity in the field opens a career path for women they may not otherwise consider. Though Emerson, McGoldrick, and Siegfried (2018) found that there is not, after all, a role model effect, Bayer, Bhanot, and Lozano (2019) found that there are enrollment benefits from increased information about the major. They add, “More careful communication about the richness of economics can draw students with diverse goals, perspectives, and backgrounds into economics classrooms and into the field” (p. 113). Although this is an area that would need further research, one can imagine that these informational efforts would likely be more productive at institutions with a higher percentage of female faculty and/or when carried out by female faculty.

It's important to emphasize that any desire to shrink the gender gap in economics is distinct from the patterns in recent decades that have resulted in males now being vastly underrepresented in the undergraduate ranks (Field, 2021). Increasing the proportion of women in economics programs does not have to be a zero-sum game, where those enrollments come at the cost of men seeking to pursue degrees in economics. Siegfried’s (2021), Scott and Siegfried’s (2021), and Scott and Siegfried’s (2022) analyses of the American Economic Association’s Universal Questionnaire show that there is capacity available across the academic landscape for more economics majors. They also show that in 2021 Ph.D. degrees rose in absolute terms for both men and women, and that the proportion of those degrees awarded to females rose from 32.1% to 33%. Continuing that trend could see female representation grow, while also avoiding the marginalizing of male students.

Chapter 2

LITERATURE REVIEW

2.1 Academic Economists and Their Decisions

The decisions that academic economists make about their teaching, their assessment, and how to allocate their time arise from many considerations. Technological resources; learning objectives; time and financial constraints; institutional characteristics and mission; incentives and rewards in the form of promotion, pay, and tenure; and demographic factors can all play a role. In light of the differing tradeoffs that instructors face in planning and making instruction and assessment choices, there is an efficiency benefit to knowing the impact of the departmental and demographic factors underlying those decisions (Schaur et al., 2012). Despite tremendous heterogeneity within Carnegie Classifications (McCormick, Pike, Kuh, & Chen, 2009), those classifications have some explanatory power for instruction methods (Harter et al., 2015) and assessment methods (Schaur, Watts, & Becker, 2012). As far as demographics go, gender has been shown to impact methodological decisions (Harter et al., 2015; Schaur et al., 2012), and may impact time allocation as well (Forrest, 2002).

2.2 Carnegie Classification

Very little of the research about Carnegie Classification focuses directly on its relationship with professor decisions about instruction and assessment methods. Instead, the vast majority of research on Carnegie classification addresses the effects of institutional characteristics, mission, or ethos on both academic and non-academic student outcomes. Instruction and assessment methods occasionally come into the picture as a mediating factor, but rarely as a primary variable. Focusing specifically on Research universities, the Boyer Commission on Educating Undergraduates in the Research University described research universities' record of undergraduate education as "one of inadequacy, even failure" (p. 37). In their examination of learning productivity in undergraduate education, Kuh and Hu (2001) explain the Boyer critique arising from the perception that research universities "ostensibly feed their undergraduates a steady diet of educationally vapid practices, such as large lecture-dominated lower-division classes that insure student anonymity and discourage meaningful intellectual engagement, reward systems that favor scholarly productivity over undergraduate teaching and advising, and heavy use of inexperienced graduate student instructors who aspire to emulate the research-oriented careers of their faculty mentors" (p. 2). Kuh and Hu note that the Boyer Report has little more than anecdotal evidence to support its critique, and Asarta et al. (2018) challenge this dominant narrative by pointing out ways R1 and R2 institutions are becoming leaders in the scholarship of teaching and learning. Still, as even they acknowledge, the dominant narrative that research institutions are primarily concerned with research and do not care about student learning does exist, and that perception is cause for concern.

Kuh and Hu (2001) run their own exploration of undergraduate education through the lens of learning productivity, which they define as “the combination of student engagement in educationally purposeful activities and the gains they make in a range of desired outcomes of college” (p. 2). They found that learning productivity varied among different types of colleges and universities. It is important to note, however, that most effects were small, meaning at most a limited impact of institution type on academic outcomes. Also of note, Kuh and Hu (2001) found that differences in engagement and learning gains by institutional type were largely accounted for by differences in student background characteristics. McCormick et al. (2009) point out that these findings mean the ‘‘institutional’’ effects appear to reflect differences in the ways students self-select into types of institutions. Students are able to make these decisions because of the ways that funding and resource choices send implicit messages about an institution’s priorities and values (Kezar & Kinzie, 2006; Pike, Smart, Kuh, & Hayek, 2006). Along that line, in their examination of the usefulness of Carnegie Classifications, McCormick et al. claimed that Carnegie Classification is often used as a proxy for mission, and they add that not many studies have found more than a minimal effect of Carnegie Classification on student achievement. McCormick et al. speculate that one of the reasons Carnegie Classifications have a limited impact on student outcomes is that they don’t capture differences in mission, programs, or other institutional characteristics very well. In other words, the Classifications may contain too much heterogeneity within each category, and thus institutional effects will not appear in a pronounced way. If this is correct, then the value of the Carnegie system may be “more heuristic than explanatory” (p. 163).

That is not to say Carnegie Classification does not affect institutional behavior. Kezar and Kinzie (2006) identified policies and practices that, not surprisingly, differ based on mission and institutional type. McCormick and Zhao (2005) describe the way that the Carnegie rankings have created a perception that Research universities are more prestigious and have thus incentivized institutions to “move up” (p. 52) the classification system. This has coincided with some institutions shifting away from prioritizing undergraduate education and moving to a focus on research and knowledge creation. Those choices have at least proximally affected teaching and assessment methods. McCormick et al. (2009) found that seniors at research-intensive universities reported lower levels of engagement in active learning compared to students at both Baccalaureate and less research-active Doctoral institutions. This insight echoes Pike et al.’s (2006) finding that attending public Doctoral/Research universities, as opposed to Baccalaureate institutions, was negatively related to student engagement. Pike, Kuh, McCormick, Ethington, and Smart (2011) add that for both seniors and freshmen, institutional characteristics accounted for a small but statistically significant difference in between-institution outcomes for both cognitive and non-cognitive measures, even after controlling for student characteristics. However, student characteristics accounted for far more of the variance in outcomes than did institutional characteristics.

McCormick et al. (2009) also found that departments serving both undergraduate and graduate students provide students fewer active and collaborative learning opportunities. In contrast, seniors at liberal arts colleges reported high levels of interaction with faculty, while students at all other institution types reported lower levels. In response to these shortcomings, one might point out findings like those of Toutkoushian and Smart (2001), who found that even after controlling for size, admissions selectivity, and institutional characteristics, students at doctoral institutions reported higher learning and communications skills gains but lower interpersonal skills, relative to students at Baccalaureate institutions. McCormick et al. (2009) instead argue that, mediated by engagement, there is actually an indirectly *negative* effect on cognitive gains in departments serving both undergraduates and graduate students. They add that, "Among the more important institutional factors influencing student engagement and learning are an institutional ethos that values undergraduate education, widespread, intentional use of empirically verified practices in undergraduate education, and widespread use of promising educational practices" (p. 147), and conclude with an exhortation that "departments that serve both undergraduate and graduate students must attend more to the intellectual needs of undergraduates (p. 155).

2.2.1 Carnegie Classification and Economics

Most of the literature available specifically on Carnegie Classification and its correlation with teaching and assessment of economics comes from iterations of the quinquennial survey. Harter, Becker, and Watts (1999) found that faculty at Doctoral institutions were mostly likely to lecture. Perhaps not surprisingly, more time spent teaching increased the probability of an instructor using cooperative learning. Harter et al. (1999) offer the generous possibility that researchers may be comparatively better lecturers. However, the findings of Palali, van Elk, Bolhaar, and Rud (2018) cast doubt on that idea. In a study conducted in the Netherlands, they found that, except in the case of master's students, students of faculty with high-quality publications do not earn higher grades. As far as course evaluations, neither master's nor bachelor's students give faculty with high-quality publications higher scores; in fact, bachelor's students give them worse. Far more plausible is Harter et al.'s (1999) supposition that good researchers may not have to use more innovative teaching techniques since their research already attracts students. They also grant, echoing the findings above, that it is possible that students at Research institutions may be better or more motivated, and thus respond better to traditional methods.

In their examination of assessment methods data from the fourth iteration of the quinquennial survey, Schaur et al. (2012), despite a low R^2, still found significant differences in teaching and assessment among schools of different Carnegie classification. First, Baccalaureate schools (including many liberal arts schools) were less likely to use multiple choice questions and more likely to use essay and short answer questions. Associate's schools, with their smaller average class sizes and instructors' primarily spending their time on teaching, were more likely to assign term papers. Baccalaureate and Associate instructors were more likely to include oral presentations and participation grades. Instructors at Master's schools were less likely to assign graded homework. Finally, instructors at Doctoral schools were less likely to use games, experiments, or simulations. Schaur et al. also examined various levels and types of economics courses. In intermediate theory courses, faculty at Master's schools were more likely to use multiple choice questions and term papers, and less likely to assign graded homework. That practice remained more or less the same for other upper-division field courses, except that at Baccalaureate schools term papers, shorter papers, oral presentations, and class participation were more often used as graded assignments. Perhaps most notable about intermediate courses was the level of similarity across all types of schools, and not the few differences. Differences started to appear more strongly in econometrics, statistics, and math economics courses, where instructors at Master's schools were more likely to use multiple choice questions and less likely to assign homework. At Baccalaureate schools, faculty were more likely to use written assignments other than formal term papers or shorter papers, and also more likely to use oral presentations.

Also using the fourth quinquennial survey, but focusing on instruction, Harter et al. (2015) found that, similar to Schaur et al. (2012), even though Carnegie Classification doesn't explain everything, there was still evidence of an impact. First, instructors at Associate's schools specialized more in teaching. Next, faculty at Master's and Baccalaureate institutions were more likely than Doctoral/Research to use cooperative learning. However, even at those schools, instructors were far more likely to lecture. Finally, placing a greater weight on teaching for promotion and tenure decisions was correlated with a host of improved teaching techniques—from active learning to examples from sports and literature, drama, and music, to classroom experiments—across all types of courses.

Some of the effects of Carnegie Classification could arise through the mediation of class size. Allgood, Hoyt, and McGoldrick (2018) found that for new faculty in Ph.D.-granting departments average class size was 60.55 students. That number fell to 36.05 students for new faculty employed by departments that do not grant a Ph.D.

The effect of Carnegie Classification on instruction and assessment also emerges from departmental culture. Allgood et al. (2018) found that department chairs at Ph.D.-granting institutions were less concerned about their new faculty employing different pedagogies than their counterparts at other types of institutions. Harter et al. (2015) found that placing a greater weight on an instructor's teaching had a statistically significant positive impact on the probability of employing cooperative learning, classroom experiments, references to literature and drama, references to sports, and news articles, in virtually all levels of economics courses and across all Carnegie Classifications. This corresponds to Allgood and Walstad's (2013) finding that instructors spend more time on their teaching at universities that assess student outcomes and at universities perceived to reward teaching. Put simply, when departments make teaching more of a priority, better teaching occurs.

2.3 Professor Gender and Methodological Decisions

Any discussion of effects that gender exerts on the choices that instructors make will necessarily feed into the larger body of work on the gender gap in economics. That literature has explored numerous factors: role model effects (Emerson, McGoldrick, & Mumford, 2012; Emerson, McGoldrick, & Siegfried, 2018; Rask & Bailey, 2002), quantitative requirements (Ahlstrom & Asarta, 2019; Emerson et al., 2018; Niederle & Vesterlund, 2010), the impact of grades on persistence (Ahlstrom & Asarta, 2019; Main & Ost, 2014; Rask & Tiefenthaler, 2008), preferences, interests, and preconceptions (Ashworth & Evans, 1999; Bansak & Starr, 2010; Goldin et al., 2019; Jensen & Owen, 2001), to name a few. Unfortunately, much of the research can be moderately or directly contradictory (Ceci et al., 2014). Thus, any additional detail on the topic can offer greater insight.

One element that is relatively certain is that the gender gap in economics has improved on many fronts and stalled on others. On the student side, Siegfried (2021) found the proportion of women in undergraduate economics has remained around 31–33%. From public universities the proportion is 31% female, from private 36% female. In fall 2020, the female proportion of new students who enrolled in either a master's or Ph.D. program in economics was 40%. This is an improvement over 2012, the last time Siegfried reported these trends. That year the proportion was 33%. In other words, the number of economics degrees is growing, but the percentage going to women is not. However, the master's and Ph.D. proportion is higher than the undergraduate, and the percentage of female applicants and the percentage of applicants offered admission is growing. Both of those numbers were 32% in 2012, but they rose to 52% and 48% respectively in 2020. On the faculty side of the gap, Ginther and Kahn (2021) found that women at research-intensive universities have reached near-parity in regard to promotion to associate professor, though that is not the same at institutions that are less research focused. Goldin et al. (2019) add that the fraction of female full professors of economics rose from 6% in 1999 to 14% in 2019. In spite of the positive movement, a gap still exists. Though the proportion of full professors has more than doubled, the ratio of male to female assistant and associate professors is still roughly 3:1 (Goldin et al., 2019; Lundberg & Sterns, 2019). Also, this ratio is worse than in other STEM fields, where the imbalance is closer to 2:1 (NSF National Center for Science and Engineering Statistics, Survey of Doctorate

Recipients, 2019). Another manifestation of the divergence between men and women in the field of economics is the smaller proportion of women who hold jobs at research-intensive universities. Watts and Schaur (2011) found that women take somewhat more jobs that involve a higher teaching-to-research ratio than men. Watts and Schaur (2011) do not address the difference between taking a job and being offered a job, nor whether this is a function of women having the same opportunities as males but simply making different choices. The sixth quinquennial survey will illuminate whether there has been any movement on this front.

Just why women take jobs that are less research intensive is not fully understood. One possibility is the perception that finding success as a researcher will be more difficult. Stupnisky, BrckaLorenz, and Laird (2019) found that in the academy at large, men reported more research autonomy and perceived success compared to women. Another possibility is that women have a comparative advantage in teaching. It's worth noting, however, that even that idea is seen by some to be an example of the implicit bias that women face in the academy (Laursen & Austin, 2020).

The research-teaching gap might also be explained by a preference for teaching. As Gautier and Wauthy (2007) note in regard to time allocation, methodological choices may also arise to some extent from instructor preferences. Unfortunately, there is not much research on this topic. In a study of engineering and sciences faculty at Doctoral/Research institutions, Link, Swann, and Bozeman (2008) identified that women at all ranks spent more time on their teaching than on research. However, they also note that the data does not allow them to explore whether that proportion is due to preferences, assignment, service, or other factors. Rawn and Fox

(2018) surveyed teaching faculty in Canada about their work makeup and their perceptions of their work, but did not break out their results by gender. Harford (2018) surveyed female academics in Ireland and found a recurring theme of conscious choices away from management positions (defined as dean level or above), but not about a preference for research vs. teaching. It's worth noting, however, that though the differences were statistically significant, neither achieved even a small effect size (Cohen's $d = .18$ and .17 respectively). Finally, in an analysis of psychology faculty, Kessler, Spector, and Gavin (2014) found that on average men prefer working with "things" (including data), while women tend to prefer working with people. They note that this is a continuum and not a binary. Perhaps most importantly, they found that men report higher job satisfaction when working in research-oriented departments, while women report higher levels of job satisfaction when working in teaching-oriented departments. In other words, though preferences are not the whole story of the teaching and placement gaps in economics, their role is an area for continued research.

Other research has also reported that female economics professors are attracted to research topics that are less valued by top economics departments. For example, Goldin et al. (2019) note that women tended to gravitate towards labor, education, health, and industrial organization as fields of expertise, as opposed to men, who tended toward macroeconomics. econometrics, and finance. Sierminksa and Oaxaca (2021) report similar findings and identify that understanding the dynamics underlying these choices is not a simple task. They offer several possible explanations and "prevailing impression[s]" (86) for future analysis: salary, job prospects, level of theoretical abstraction, and personal characteristics.

Another possible explanatory factor for both the gender gap in economics as a whole and the lower proportion of women at research-intensive universities is the reputation of economics as a very competitive discipline. Admittedly, there is at this point no empirical work on that reputation, and competitiveness would be difficult to quantify (Lundberg & Stearns, 2019). There is however work on women and competition. In a qualitative study of Australian economics students, Ingleton (1997) reported that women were far less likely than men to refer to competition as a strong motivator to succeed in economics. Croson and Gneezy (2009) found that women are more reluctant to engage in competitive interactions. They add that men's performance, relative to women's, improves under competition. Niederle and Yestrumskas (2008) found that women are less likely to choose challenging tasks when they are uncertain of their ability to perform them or when there is limited flexibility or high commitment requirements. However, it should also be noted that when those factors are reversed, women accept challenges at the same rate or higher than men do. Perceived ability and perceived relative ability are important pieces of the competition factor. Niederle and Vesterlund (2010) found that women rate themselves lower than men rate themselves; that women are more responsive to the gender of their competitors; that women are more competition-averse; and that responses to competition may distort differences in underlying skill. Similarly, Datta Gupta, Poulsen, and Villeval (2013) found that women are more likely to avoid competitive environments, especially when they know their opponent is male. Somewhat in contrast to those findings, women in a study by Kuhn and Villeval (2015) demonstrated task performance not adversely affected by entering an environment where rewards are team based. Nor did women avoid entering team environments. Perceived ability was still incredibly important, with women being more generous in their perception of team members' skill. Given the nuance and apparent contradictions, this too is an area for future research.

Another possibility is that the competition is not the deterrent; rather, prospective economists may be repelled by the hostile tone that can accompany it. In other words, women may simply find economics to be a more hostile environment, and justifiably so. For example, though Anderson and Siegfried (1997) found no bias against female instructors in teaching evaluations, Boring (2017) and Keng (2020), among others, have. This finding is in line with the wider body of research in STEM as well. Similarly, Dupas et al. (2021) found that women receive more hostility at economics conferences. In their wider analysis they concluded, "[O]ne characterization of the emerging literature on gender biases within the economics profession is that every rock we look under reveals yet another way in which existing institutions are biased against women" (p. 26).

Whatever the case, addressing the gender gap and its causes and manifestations will require patience. As Breen and Garcia-Peñalosa (2002) noted, even if tomorrow women and men woke up with the same preference for studying economics, women still might not choose it because of lingering issues of perception about the field, the challenges, the jobs it prepares them for, and so on.

The differences between the ways that men and women experience academic economics leads to the questions this study will seek to answer. First, do women and men differ in their instruction and assessment methods? And if so, are those differences the function of gender or are they explained by the differences in schools at which they teach? On the first question, research arising from previous quinquennial surveys provides useful benchmarks. With data from the first quinquennial survey, Harter et al. (1999) found that males were more likely to lecture heavily, and that being male decreased the probability of using cooperative learning. They also found that instructors who spent more time on teaching had a higher probability of employing cooperative learning. If women are more represented at schools that are less research-intensive, then it would make sense that they make use of cooperative learning more frequently. Harter et al. (1999) also refer to the fact that differences in the ways males and females process economics may be reflected in their teaching methods. If this is the case, then perhaps females have a comparative advantage in designing cooperative learning. They also note that females may tend to use teaching methodologies that favor the skills in which females have a comparative advantage. Working from the fourth quinquennial survey and focusing on assessment, Schaur et al. (2012) found that in principles classes, female instructors were about 8 percentage points less likely than males to use multiple choice questions and 4 percentage points less likely to assign term papers, but about 8 percentage points more likely to use essay questions, homework, and student oral presentations, and 11 percentage points more likely to assign short papers. In intermediate theory classes, female faculty were again more likely to use short papers, oral presentations, and class participation for grades, by about 11–12 percentage points.

In other upper-division field courses the same patterns hold, and the gender gaps rise even more, ranging from 16–19 percentage points. Using the fourth quinquennial survey to explore instruction methods, Harter et al. (2015) found that female faculty are about 14 percentage points less likely to "usually or always" lecture in all types of classes, and even more so in upper-level field courses. They are 16–21 percentage points more likely to use cooperative learning methods. They are about 14 points less likely to use sports references and examples in all types of classes except statistics and econometrics. Females are about 10 points less likely to use references to literature, drama, and music in intermediate theory and upper-level field courses.

2.4 Time and the Academic Economist

Between teaching and service, academic economists face very different time allocation issues than their non-academic counterparts. Siegfried and White (1973) provided the first analysis of the incentives and reward structures that contribute to those decisions. Becker (1979) followed this up with a theoretical model examining the expected effects of adjustments to the weight a department may place on an instructor's teaching and research. Since then, other work explored the factors underlying time allocation choices not just by economists, but in the academy at large. Though some work has been done on the allocation itself, much less work examines whether there is a difference between allocation and *preferred* allocation. Similarly, most work on the time allocation of academics looks at the academy as a whole, or a small range of disciplines (for example, the sciences or STEM: Forest, 2002; Gautier & Wauthy, 2007; Link et al. 2008; Stupnisky et al., 2019). The problem with drawing conclusions about economics from studies that include other departments is that economics departments and economists so often behave differently than the others (Frank, Gilovich, & Regan, 1993; Frank, Gilovich, & Regan, 1996; Routon, 2018; Walstad & Allgood, 2005; Winters, 2016). Focusing on academic economists allows this study to examine factors that may operate differently in economics than in other fields. The essay chapter including the analysis of time allocation will connect to the other essay chapters by also examining time allocation questions in terms of gender and Carnegie Classification. Finally, this study will seek to understand whether rewards and incentives make a difference in the time allocation choices of academic economists.

As noted above, Gautier and Wauthy (2007) argue that time allocation stems from incentives and preferences. As far as preferences go, one cannot escape the perception (reputation?) in the academy that research has a higher status than teaching. On a recent episode of his *EconTalk* podcast, economist Russ Roberts referred to the notion and expectation that promotion at Research universities is based on both research and teaching as "pretend" (Roberts, 2021). This view appears throughout time allocation research. Wilkesmann and Schmid (2014) report that "…[T]eaching is said to be the professoriate's neglected stepchild" (p. 6). In a survey of new faculty across a variety of disciplines, Stupnisky, Pekrun, and Lichtenfeld (2016) found that some faculty find teaching a paid requirement of their job that evokes anxiety or boredom. As far back as 1984, Finkelstein explained the reason for this was a sort of "monkey-see-monkey-do" effect of Ph.D. graduates of Doctoral universities being socialized to believe that research is most important, and then perpetuating that idea. Walstad and Allgood (2005) echo these observations: early in graduate school students learn, either explicitly or implicitly, that teaching is not as important as research. Forest (2002), in his exhaustive and international treatment of the issue of preference for teaching, adds that faculty perception of the quality of their preparation plays an important role. If one had a positive perception of their teaching training, there was a higher chance of preferring to teach. Similarly, a positive perception of one's research training negatively related to a preference for teaching. Considering the research focus of the majority of Ph.D. economics programs, the preference for research is the natural result.

Forest (2002) based his examination of academia on the simple question, "Regarding your own preferences, do your interests lie primarily in teaching or in research?" In addition to his insights into the relationship between training and preferences, he found that though age correlated positively with an orientation toward teaching, time in the profession did not. In the U.S., time at one's institution was a significant predictor of a preference for teaching, as was time between leaving school and returning to teach. Having a Ph.D. was a negative predictor of a preference for teaching. Faculty employed at liberal arts institutions., not surprisingly, were significantly more likely to indicate a preference for teaching; those employed at R1's or R2's tilted to research. In the U.S., having tenure positively correlated with a teaching preference, but this finding only explained 1% of the variance in responses.

As far as the time breakdown itself, Link et al. (2008) examined engineering and sciences faculty at Doctoral/Research universities. The mean hours spent teaching was approximately 17 and researching 20. In a comparison of economics, business, physics, math, psychology, and political science faculty, Allgood and Walstad (2013) found that economists allocate less time to teaching than any of the other disciplines, and more time to research than all other departments except physics. Allgood et al. (2018) add that new faculty at programs that grant a Ph.D. spend more time engaging in research than do new faculty in departments without a Ph.D. program, at 58.24 percent and 32.15 percent, respectively. New faculty in Ph.D.- granting departments spend 32.03 percent of their time on teaching-related duties, while new faculty in departments without a Ph.D. program spend 53.76 percent of their time on teaching activity.

Turning to productivity, Bentley and Kyvik (2013) sought to examine the factors that would predict research vs. teaching productivity. Interest in research, as opposed to teaching, was the largest predictor in research productivity. Somewhat surprisingly, departmental policies toward research and the research status of faculty were weak predictors of research productivity, although the impact was stronger in English-speaking countries. It's possible that self-selection into institutions where research is valued has masked the impact of "publish or perish" policies, whether explicit or implicit. In other words, the individuals attracted to that kind of institution arrive with that mindset already operating, and thus the policy itself is unnecessary. Not surprisingly, the most significant factor for research productivity was autonomous motivation. Going one level deeper, Bentley and Kyvik (2013) found that the psychological needs of competence, autonomy, and relatedness acted as the greatest predictors of autonomous motivation. They also found that type of institution had a significant effect on motivation itself. Among Doctoral and Master's faculty autonomous motivation was predicted by autonomy and competence, while for bachelor's faculty autonomous motivation was predicted by competence and relatedness. Among faculty at Doctoral institutions, autonomy correlated positively with introjected and external motivation. This finding may be related to the socialization factor mentioned above, as well as efforts to gain rewards that are less connected to teaching. Similarly, they also found that external motivation was not a significant predictor of employing best teaching practices. These findings also relate to those of Kezar and Kinzie (2006) who reported that policies and practices will time allocation decisions, and that these differ based on not just institution type, but also institutional mission. For example, liberal arts colleges expect their teachers to spend more time grading so that they can give students deeper and more detailed feedback.

Type of institution also has a significant role in satisfaction. Webber (2018) found that faculty who were employed at private institutions were more likely to report higher satisfaction than peers at public institutions. This included satisfaction with salary, despite reporting lower earnings. This confirms the intuition that job satisfaction arises from more factors than salary. Salary is important to an extent, but so are interactions with students, engaged leadership, feelings of having a say in the college's governance, and a flexible work schedule. These findings are confirmed by Webber and Rogers (2018), who report more satisfaction by faculty at Baccalaureate institutions, and add that environmental factors were more important than demographics like age, race, or salary.

The topic of job satisfaction helps to introduce the question of whether actual faculty time allocation matches preferred time allocation. Walstad and Allgood (2005) used National Center for Education Statistics data and compared economics, social science, biological sciences, physical sciences, mathematics/statistics, computer sciences, engineering, and business faculty at Research or Doctoral institutions. They found that economics faculty spent more time on teaching than their peers in other sciences (50% to 44%). They also found the academic economists would prefer the proportion to be closer to 41%. Only biology faculty had less of a preference for teaching. Also, economics faculty showed a greater level of discontent with their time allocation than any other group. Other findings of note were that economists viewed greater opportunity to teach as an inconsequential reason to leave a job more than any other group in the survey, and a greater opportunity to conduct research as a meaningful reason to leave a job more frequently than any other group. Finally, economists disagreed more strongly than any other group with the statement "Teaching effectiveness should be the primary criterion for promotion of faculty/instructional staff at this institution," to the point that Walstad and Allgood (2005) refer to economists as outliers compared to the other groups, and declare that "economists…show the greatest disdain for teaching" (p. 182). Similarly, economists were more enthusiastic than any other group in their agreement with the statement "Research/publications should be the primary criterion for promotion of faculty/instructional staff at this institution" (p. 182). As Walstad and Allgood (2005) point out, these conclusions wouldn't be all that surprising or compelling if economists' views were in line with others in the sciences, but clearly that is not the case.

Many of the findings above treat teaching and research as mutually exclusive. However, some researchers argue that the "teaching vs. research" dichotomy is flawed on its face and that teaching and research are not substitutes but complements. Gottlieb and Keith (1997) explored that idea and found that research and teaching are not mutually exclusive activities. Gautier and Wauthy (2007) argue that there does not have to be a trade-off between teaching and research, or even between teaching funding and research funding. The right incentive structure can actually turn the two activities into complements of one another. Along this line, Becker and Kennedy (2005) reported that 85% of survey respondents felt their teaching had enhanced their research. Siegfried (2006) however warns against drawing too much from this finding. He argues that these same economists might be inspired by their reading, eating, drinking, running, golfing, etc. He adds that the question is not whether teaching complements research, but how often and for whom. That question remains unanswered, he argues, because Becker and Kennedy's sample was not random. Similarly, Marsh and Hattie (2002) argue that research productivity or skill and teaching productivity or skill are independent constructs, almost totally unrelated to one another. Taylor, Fender, and Burke (2006) add that both teaching and service commitments have a significantly negative impact on the research productivity of academic economists.

As Harter, Becker, and Watts (2011) point out, time allocation specifically for economists has unique connections to gender considerations. Particularly for women, time allocation choices could have myriad factors operating under the surface. Watts and Schaur (2011) found women occupy somewhat more jobs that involve a higher teaching-to-research ratio than men, but the question of why has not been fully explored. In like fashion, Forest (2002) found that gender was a predictor of one's orientation toward teaching, but added that there was not anything to explain why. Tierney and Bensimon (1996) note the "hidden workload" that female faculty often face, as well as expectations that they be more nurturing. Failure to satisfy this expectation can hurt female instructors course evaluations (Buser, Batz-Barbarich, & Hayter, 2022). Hammermesh (2005) adds that, as noble as the goal may be of equal representation of females on committees, since there are relatively fewer women, this just means a greater service commitment for women, pulling them away from research. Taylor et al. (2006) found that male economists overall have a 41% higher research productivity. Breaking that down by institution type showed that male faculty at Doctoral institutions are almost 60% more productive, while at undergraduate institutions the figure drops to 32%. At Master's institutions, however, female faculty are 2% more productive. Similarly, Link et al. (2008) report that female academics at all ranks spent a greater fraction of their time on teaching than on research. Returning to the satisfaction question from above, Webber's (2019) examination of survey data from the Collaborative for Academic Careers in Higher Education found that female academics were more likely to report lower satisfaction, and Webber and Rogers (2018), using the same data, found that more male academics were satisfied or very satisfied with their salary. Interestingly, women in STEM fields were not less satisfied than their peers in non-STEM fields, and non-tenure-track females were more satisfied than tenured peers. These findings suggest that not all of the gender issues plaguing economics are unique to economics. They also suggest that it may be important to explore gender issues in the academy along a different set of dichotomies. For example, it is possible that rather than comparing male and female faculty, comparisons across Carnegie Classifications, across ranks, and between tenure and non-tenure track faculty would yield greater insights into faculty experiences.

The next question that time allocation literature explores is that of the solutions to the problems above; specifically, whether adjusting incentives and rewards would have any transformational effect. Stupnisky, BrckaLorenz, Yuhas, and Guay (2018) state the obvious:"faculty may be differentially motivated for teaching based on how their institution rewards their efforts" (p. 18). However, Forest (2002) argues that revamping tenure would not do much to improve classroom instruction. Instead, he proposes that any desire to create more and better collegiate educators will require changes to the training (in other words, coursework) of future academics. This echoes the socialization comments by Finkelstein (1984). In their examination of academic productivity, Bentley and Kyvik (2013) found that departmental policies toward research and the research status of faculty were weak predictors of research or teaching productivity, though the impact was stronger in English-speaking countries. Link et al. (2008) add that the solution will depend on the cause. For example, if the differences in time allocation are driven by a difference in preferences by male and female academics, the introduction of ‘‘differentiated roles’’ may help. However, if the driving force is cultural, or perhaps endemic to the culture of academia, then progress will require a different set of approaches. In that vein, Wilkesmann and Schmid (2014) argue that a “supportive teaching culture” (p. 20) will be more effective than monetary incentives in bringing about more attention to and improvement of teaching. Countering the arguments against changing incentives and instead changing culture, Allgood and Walstad (2013) found that professors *do* respond to incentives in the allocation of their time. They found that faculty spend more time on teaching at universities that assess student outcomes and at universities perceived to reward teaching, and they spend more time on research if standards for tenure are higher. One possible explanation of those studies that find minimal impact of incentives and rewards is that self-selection into institutions where research is valued masks the impact of “publish or perish” policies, whether explicit or implicit. In other words, the policy does nothing because the individuals attracted to that kind of institution arrive with that mindset already operating. All of this is complicated by Bentley and Kyvik’s (2013) finding about the different strengths of motivation from external rewards depending on the type of institution, and that external motivation does not relate to employing best teaching practices. It is therefore also possible that differences could exist between departments, and that incentives and rewards may affect economists differently. It would not be surprising to find that a discipline that spends its time teaching students about the power of incentives would be populated by people who think about incentives and respond to them more potently.

Chapter 3

DATA AND METHODOLOGY

Each essay chapter in this study bases its analysis on data from the Sixth National Quinquennial Survey on Teaching and Assessment Methods in Undergraduate Economics. Section 3.1 provides a history of the quinquennial survey. Section 3.2 describes the changes and other particulars specific to the most recent iteration. Section 3.3 addresses the data analysis methods employed in each chapter.

3.1 The Quinquennial Survey on Teaching and Assessment Methods

Economists William E. Becker and Michael Watts began administering a national quinquennial survey on teaching and assessment methods to academic economists in 1995. Three years before this, economist Martin Anderson published *Impostors in the Temple*, a—in the words of its own jacket—"hard-hitting, eye-opening book about the intellectual and moral decay of American universities and colleges." His critique includes the following indictment:

> "In the Alice-in-Wonderland world of today's academic intellectuals, the priorities are topsy-turvy. The teaching of students, the main reason for the existence of colleges and universities, gets…'no respect.' An increasing number of professors not only do not like to teach (and avoid it whenever possible) but, even worse, have little regard for the teaching efforts of their colleagues. There is now a widespread contempt for teaching among the teachers on our university and college campuses the immediate losers are the

> young men and women who are the students. The long run losers are all of us, as the country loses all those things that might have been if the best and the brightest of our young people had achieved their potential." (p. 45–46)

This is the world and environment Becker and Watts sought to change. Even prior to the publication of Anderson's book, the National Council on Economic Education (NCEE) and the American Economic Association's (AEA) Committee on Economic Education had undertaken efforts to both "improve the teaching of economics and to promote innovative teaching methods" (Becker & Watts, 1996; p. 448). Becker and Watts began the quinquennial survey in 1995 in an attempt to assist those efforts.

In service of the goal of improving the teaching of economics, the survey seeks to establish a comprehensive dataset describing the instruction and assessment methods of economics instructors at American colleges and universities. Since its first iteration the survey has had three primary sections. Part one focuses on instructional methods and invites respondents to indicate on a non-linear scale how often they use particular instructional methods. From 1995–2010 the range was 0–4. The 2020 iteration of the quinquennial survey adjusted the scale to run from 0–6. Both scales, their midpoints, and their descriptions can be found in Table 3.1.

Table 3.1. Scale of Responses for Teaching Methods Survey Section

2010				2020			
Integer	Descriptor	% of time used	Median value (%)	Integer	Descriptor	% of time used	Median value (%)
0	Never	0	0	0	Never	0	0
1	Rarely	1–10	5.5	1	Very rarely	1–10	5.5
2	Occasionally	11–33	22	2	Rarely	11–33	22
3	Frequently	34–65	49.5	3	Occasionally	34–50	42
4	Almost Always	66–100	83	4	Frequently	51–65	58
				5	Very Frequently	66–85	75.5
				6	Usually or always	86–100	93

Table modeled after that in Asarta et al. (2021)

Part two focuses on assessment methods. Instead of a 0–4 or 0–6 scale, the survey asks instructors to indicate the percentage weight of the course grade that comes from each method. Within the section on grading, the survey also includes a set of questions on mathematical importance in an instructor's course. Rather than asking how important various math skills themselves are, in order for those questions to fit more neatly under the grading banner, the survey asks about the importance of problems and exam questions requiring certain mathematical skills. Those skills are broken into four categories: numerical calculations, graphs, algebra, and calculus. Respondents are given the choices of "0, Not at all important"; "1, Somewhat important"; "2, Important"; "3, Fairly important"; or "4, Extremely important." Part three seeks background information on respondent demographics and characteristics of the institutions where they teach.

The survey, as its name suggests, has been sent to academic economists every five years since 1995[1]. The 1995 iteration of the quinquennial survey went out via hard copy to 3,059 academic economists, generating a response rate of 21%; in 2010, researchers mailed the survey to 4,045 academic economists, generating a response rate of only 10.5% (Asarta et al. 2021; Watts & Schaur, 2011). As Becker and Watts (1996) themselves acknowledge, there is no way to know if the sample is representative of all academic economists in the United States. In fact, it almost certainly is not. Also, as Asarta et al. point out, Becker and Watts were unable to use the same mailing list each time they administered the survey. This means the mix of economists receiving the survey, and whether that mix leaned more toward teaching-focused or research-focused faculty, could have changed from iteration to iteration. Still, the intuition from the beginning has been that economics instructors willing to take the time to complete a survey on teaching and assessment methods are also more likely to be those with an interest in teaching well. The results are therefore likely to exhibit an upward bias in the rating of methodological variety. On a similar note, Sheridan and Smith (2020) found that professors think they employ greater variation than they actually do. In other words, whatever the respondents may indicate about the state of economics instruction, the reality is a landscape of less variety of both classroom teaching and assessment.

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[1] The survey was sent out in 2015, but after the unexpected death of Michael Watts, one of the original authors, the results were never released.

3.2 The 2020 National Quinquennial Survey

Invitations to complete the 2020 survey were delivered via email in early 2020. Initially, organizers planned to leave the survey open through the entire spring semester. However, when schools began to shift their classes online, organizers closed the response window to avoid potential inconsistences arising from the changes institutions adopted to address the pandemic.

Survey responses were gathered in electronic format only. Rather than using an existing mailing list, like AEA membership as Becker and Watts had done, the email addresses for each invitation were obtained by manually visiting the websites of academic institutions. Institutions had to be included in the *Integrated Postsecondary Education Data System (IPEDS)* to be included in the email address gathering. This strategy increased invitations by 185% over the 2010 iteration of the survey. The survey was sent to 11,544 full-time and part-time instructors and generated 1,664 responses. This response rate of 14.4% constitutes a 3.9 percentage point increase over 2010. A summary of the number of survey invitations emailed and the response rates by Carnegie Classifications appear in table 3.2 below.

Table 3.2. Response Rates for 2020 Survey by Carnegie Classification

Carnegie Classification	Emailed invitations	Surveys in this study
Associate’s	349	18
Baccalaureate	2,073	252
Master’s	2,595	248
Doctoral	6,527	620
Total	**11,544**	**1,138**

In addition to the change described above to the scale for instructional methods questions, technological and cultural shifts necessitated other improvements to the 2020 iteration of the quinquennial survey. First, changes in technology have resulted in adjustments to the slate of methods. For example, questions about CD-ROM databases are now obsolete, replaced by online databases like Federal Reserve Economic Data (FRED). The last ten years has also seen changes to the materials and assessment methods available to instructors. The 2020 survey reflects those changes with questions about online tools such as adaptive learning assignments, online textbooks, and online quizzes and exams. The full survey can be found in Appendix A. The expanded categories of questions can be found in Table 3.3.

Table 3.3. Question Categories from the 2020 Quinquennial Survey

In-class Presentation
Discussion/Student Response
Classroom Activities
Materials
Use of Databases
Literature Searches of Published and Working Paper Research
Grading
Background Information

Cultural changes also brought about improvements to the survey. Given the recent emphasis by the AEA in particular and the economics profession more generally to increase the number of women and underrepresented minorities (URM) in the discipline (see Ahlstrom & Asarta, 2019; Bayer, Hoover, & Washington, 2020; Bayer & Rouse, 2016; Goldin et al. 2019), the survey has expanded the Activities section. Rather than asking just one question about gender, race, and ethnicity issues, the survey now includes questions about lessons on gender issues, lessons on diversity and inclusion issues, references to gender issues, and references to diversity and inclusion issues (see Ahlstrom, Asarta, & Harter (2023) for an exploration of these survey questions). The section on demographics has also expanded. First, the race question has been adjusted to mirror the slate of race options on the US Census. Next, the gender question now includes a non-binary option[2]. Finally, the question on rank now includes an option for professors who are non-tenure track.

3.2.2 Format of the Survey

The survey itself was administered using the Qualtrics software platform (Qualtrics, 2020). The Qualtrics platform employs branch logic, which reduces the both the cognitive load and time required to complete the survey from over 20 minutes to less than 15. As Asarta et al. (2021) have speculated, this was almost certainly one of the reasons for the increased response rate for 2020.

3.3 Data Analysis Methods

Each essay chapter of this dissertation seeks to extend and/or update previous work on the quinquennial survey. Data analysis methods therefore differ for each chapter, and replicate the methods employed by the authors whose work provides the foundation for this dissertation.

3.3.1 Differing methods of Instruction and Assessment at schools of varying Carnegie Classification

The first essay chapter explores methodological differences at schools of varying Carnegie classifications and employs similar analysis methods to those of Schaur et al. (2012) and Harter et al. (2015). In addition to descriptive statistics, linear

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[2] Only three respondents returned an answer of "non-binary" on that particular question.

regression estimations are used in which dependent variables are the binary variables for whether an instructor used a particular method. The independent variables are binary categorical variables for each Carnegie Classification, with Doctoral the omitted category. As Schaur et al. and Harter et al. point out, OLS is more fitting in this analysis for several reasons. First, this specification means that adding the coefficients for each Carnegie Classification to the constant term will provide the percentage of instructors using the instruction or assessment method at each type of institution. Second, running regressions with Carnegie Classification as the only independent variable eliminates the chance of collinearity issues with other institutional characteristics. Next, probit regressions would have provided non-linear transformations of the values. Finally, Schaur et al. (2012), Harter et al. (2015), and the broader work on Carnegie Classification finds a low R^2 for both present and past estimations of any causal impact of Carnegie Classification on instructor's choice of methods. All of this also makes probit less ideal for the task. That low explanatory power means the primary goal of this analysis is simply to provide a picture of the methods used to teach and assess economics across classifications. Estimations are conducted at the course levels of principles; intermediate; statistics, econometrics, and math economics; and other upper division courses.

3.3.2 The Impact of Professor Gender on the Choice of Methods

In keeping with the work of Schaur et al. (2012) and Harter et al. (2015), rather than exploring the impact of professor gender on the frequency with which an instruction or assessment method is employed, this essay chapter explores the impact on whether a method is employed at all. Probit regression models are used to estimate the probability of an outcome given some set of independent variables, and therefore are more suited to this analysis than linear regression. The dependent variable in a standard probit model only has two outcomes.

$$y_i = \begin{cases} 1 \text{ if a professor } i \text{ employs a method} \\ 0 \text{ othwerwise} \end{cases}$$

This means that the probability that an instructor employs a specific method is based a set of demographic and institutional explanatory variables for each instructor i. The general model expressing that probability would take the form

$$Pr(y_i = 1|X_i) = X_i^{\top}\beta + \delta_i$$

where y_i is the instructor's choice of whether or not to use a specific method, $X_i^{\top}$ is the vector of independent variables, and δ_i is an error term following a normal distribution (Asar & Kilinç, 2020).

Probit regression is also better suited for the analysis in this chapter because of the non-linear scale that respondents used for answering questions about their instructional methods.

Because the probit regression can only provide indication of the direction of the relationship between variables (Becker & Kennedy, 1992), regression results are used to generate marginal effects estimates to better determine the magnitude of the effect of each independent variable. For dichotomous predictors, marginal effects measure how $Pr(y_i = 1)$ changes as a categorical variable changes from 0 to 1 (Williams, 2012). For continuous variables, the marginal effect is being compared against the average (Williams) and equals the relevant slope coefficient (Cameron & Trivedi, 2013). Marginal effects are estimated with variables having been fixed at their means. Each categorical variable has a median value of zero, zero so serves as the base value.

3.3.3 Determinants of Actual and Preferred Time Allocation

The data analysis methodology for exploring the determinants of instructor time allocation choices and preferences will replicate methods used in previous time allocation work based on the quinquennial survey by Harter, Becker, and Watts (2011). As explained elsewhere in this dissertation, data from the quinquennial survey comes from an opportunistic sample, and the intuition is that that sample is more likely to include those faculty most interested in teaching. For analysis of time allocation particularly, there is a danger that this self reporting could lead to biased results. Harter et al. argue that the risk of bias is minimal. For example, instructors who prefer to teach could overemphasize the weight their departments place on teaching if they are in positions that reward teaching, or overemphasize the weight of research if they feel their departments' research demands are excessive. In keeping with the Harter et al. methodology, this study will not make any attempt to adjust for potential sample selection issues.

In keeping with Harter et al.'s (2011) analysis using quinquennial survey data, this study will employ descriptive statistics in defining and finding mean values for dependent and independent variables. For the determinants of time allocation, this study will employ ordinary least squares regressions where the dependent variables are the time allocation choices as measured in percent of total time and independent variables are demographic and institutional characteristics. Regressions for actual time allocation choices will then be replicated for preferred time allocation. Comparison of actual vs. preferred time allocation will involve comparing regression coefficients from each model. Similar to Walstad and Allgood's (2005) approach to the NSOPF data, this study will also compare mean reported time allocations and mean preferences for all respondents, and then disaggregate the data by institutional and demographic characteristics.

Chapter 4

CARNEGIE CLASSIFICATION: UNDERGRADUATE ECONOMICS INSTRUCTION AND ASSESSMENT METHODS INSTITUTIONS

4.1 Introduction

The Carnegie Classification of Institutions of Higher Education describes itself as “the leading framework for recognizing and describing institutional diversity in U.S. higher education” (https://carnegieclassifications.acenet.edu). The Carnegie Commission began developing the system in 1970. However, stereotypes have long existed about the experience a student can expect at different types of colleges and universities (Kuh, 2003; Kuh & Hu, 2001; McCormick et al., 2009). Larger schools are impersonal but offer more options, professors at liberal arts schools care more, smaller colleges have richer student life, and so on. The stereotypes, the changes to the Carnegie Classification System over the years, and system’s own criteria raise the question at the heart of this study: Do economics instructors teach and assess economics differently at schools of differing classifications?

4.2 Insights and Impact of Carnegie Classifications

As with most stereotypes, previous work has uncovered at least some truth in the public perception. However, very little of the research about Carnegie Classifications focuses directly on their relationship with faculty decisions about instruction and assessment methods. Instead, the majority of research on Carnegie Classification addresses the effects of institutional characteristics, mission, or ethos on both academic and non-academic student outcomes (Kezar & Kinzie, 2006; Kuh, 2003; Kuh et al., 2006). Instruction and assessment methods occasionally come into the picture as a mediating factor, but rarely as a primary variable. Still, institutional characteristics will affect the incentives facing instructors as they make decisions regarding their methods (Kuh & Hu). Despite tremendous heterogeneity within Carnegie Classifications (McCormick, Pike, Kuh, & Chen, 2009), Carnegie Classification has some explanatory power for student engagement, instruction methods (Harter et al., 2015) and assessment methods (Schaur, Watts, & Becker, 2012). Other research has found that the limited explanatory benefit can be accounted for almost entirely by student background and other characteristics. However, this means that the institutional effects reflect students matching themselves to institutions that align with their preferences and goals (Ku & Hu, 2001; McCormick, Pike, Ku, & Chen, 2009).

Even if Carnegie classification does not have a causal effect for instructor decisions, previous work suggests that it can drive decision making at colleges. Despite Carnegie's insistence that their system is meant only to classify and not to rank, schools often see the classification as a hierarchy given Carnegie's own explanations of "moving up" in rank and how to do so (Kosar & Scott, 2018; McCormick & Zhao, 2005). Schools target a rank. Achieving that in a practical sense requires adopting a certain mission. In the case of Doctoral institutions, that mission will prioritize research and diminish the importance of teaching. As evidence of this, plans to move up the Carnegie scale do not include teaching goals. Plans to improve the classification system itself also omit teaching goals (Kosar & Scott, 2018). This focus on research led the Boyer Commission on Educating Undergraduates in the

Research University to describe Research universities' record of undergraduate education as “one of inadequacy, even failure” (p. 37). Kuh and Hu (2001) point out that the Boyer Report has little more than anecdotal evidence to support its critique, and Asarta et al. (2018) challenge this dominant narrative by pointing out ways R1 and R2 institutions are becoming leaders in the scholarship of teaching and learning. This echoes the work of Kezar and Kinzie (2006), who noted that Research universities do not have to resign themselves to remaining behind others in their adoption of innovative teaching. Rather, because of their research activities and campus resources, they are in a unique position to “create an environment of unparalleled challenge, active learning, and interaction” (p. 170). Still, McCormick et al. (2009) found that, mediated by engagement, there is an indirect negative effect on cognitive gains in departments serving both undergraduates and graduate students. They add that, “Among the more important institutional factors influencing student engagement and learning are an institutional ethos that values undergraduate education, widespread, intentional use of empirically verified practices in undergraduate education, and widespread use of promising educational practices” (p. 147). They conclude with an exhortation that “departments that serve both undergraduate and graduate students must attend more to the intellectual needs of undergraduates” (p. 155).

Narrowing the focus to the relationship between Carnegie Classification and economics instruction, Schaur, Watts, and Becker (2012) and Harter, Schaur, and Watts (2015) provide the most relevant analysis. Schaur et al. examine determinants of assessment methods, and Harter et al. examine determinants of teaching methods. Both papers use data from the 1995, 2000, 2005, and 2010 quinquennial surveys. Both articles spend the first part of their analysis on a profile of methods across Carnegie

Classifications. Schaur et al. find that at the principles level, writing assignments of any kind are more likely to appear at Baccalaureate and Associate's schools. Faculty at Doctoral schools were less likely to include games, experiments, or simulations in course grades. They also find that at the intermediate level, apart from faculty at Master's institutions more often using term papers and multiple choice questions, grading methods are fairly homogeneous. In upper division courses the trend is the same except for Baccalaureate institutions, whose faculty are more likely to use shorter papers, oral presentations, and class participation. These choices by Baccalaureate faculty also hold in statistics and econometrics courses. For teaching methods, Harter et al. find that instructors at faculty at Baccalaureate and Master's institutions are more likely than those at Doctoral institutions to use cooperative learning in all courses. However, faculty at Associates schools are more likely than those at the other classifications to employ a host of non-lecture strategies.

4.3 Relevance of the Current Study

This study will update and expand on the work in Schaur, Watts, and Becker (2012) and Harter, Schaur, and Watts (2015). There is reason to believe in the ten years since the fourth quinquennial survey that at least some change has occurred in collegiate economics. At the very least there is reason to believe there has been adoption of new technology. Asarta, Chambers, and Harter (2021) found increased use of PowerPoint/computer-generated displays in introductory classes relative to the 2010 survey results. Furthermore, the availability of online textbooks and testing options has increased access to electronic and even immediate grading of assignments and assessment. This has raised the relative opportunity cost of written assignments. Also, even though the average years of experience of survey respondents has remained at 17 years, respondents to the 2020 iteration include a younger generation that has entered the discipline. This analysis also expands on the work of Schaur et al. and Harter et al. by looking at the entire slate of instructional and assessment methods, rather than just a selection of methods.

On a practical and policy level, this study will assist administrators and economics department chairs in their decision making. Providing leadership interested in improving the variety of their teaching with a benchmark both within and across classifications offers a source of motivation and persuasion. This in turn could help increase pedagogical variety in collegiate economics.

Given the ways that the COVID-19 pandemic has adjusted collegiate academics, the 2025 iteration of the quinquennial survey has the potential to provide compelling insights into the way those adjustments manifested themselves in economics departments. Drawing as many insights as possible from the 2020 quinquennial survey will offer benchmarks that will make future explorations more meaningful. In addition, the Carnegie Classification System received its latest update at the end of 2021. This study will supply future researchers with a data point on the impact of Carnegie Classification from which to analyze the 2021 update.

4.4 Data Sources and Variable Construction

Data for this study comes from the Sixth National Quinquennial Survey on Teaching and Assessment Methods in Undergraduate Economics. Invitations to complete the 2020 survey were delivered via email and survey responses gathered in electronic format only. A summary of the number of survey invitations emailed and the amount of surveys included in this analysis, broken by Carnegie Classification, appear in Table 4.1.

Table 4.1. Survey Invitations and Complete Responses by Carnegie Classification

Carnegie Classification	Emailed invitations	Surveys in this study
Associate’s	349	18
Baccalaureate	2,073	252
Master’s	2,595	248
Doctoral	6,527	620
Total	**11,544**	**1,138**

One important difference between the 2020 version and all previous iterations of the quinquennial survey is the scale available to participants for instructional methods questions. Becker and Watts (1995) employed a non-linear scale of 0–4, and subsequent iterations used that scale as well. To provide more precision to the results, the current survey offered a 0–6 scale for methods questions. Table 4.2 lists scales and midpoints for each version.

For grading methods, the survey does not ask instructors how often they use a particular method. Instead, instructors are asked to indicate the percentage weight of the course grade that comes from each method. The scale for the questions on the importance of problems and exam questions requiring certain mathematical skills also differed from the scale for teaching methods. Respondents were given the choices of “0, Not at all important”; “1, Somewhat important”; “2, Important”; “3, Fairly important”; or “4, Extremely important.”

Table 4.2. Scale of Responses for Teaching Methods Survey Section

2010				2020			
Integer	Descriptor	% of time used	Median value (%)	Integer	Descriptor	% of time used	Median value (%)
0	Never	0	0	0	Never	0	0
1	Rarely	1–10	5.5	1	Very rarely	1–10	5.5
2	Occasionally	11–33	22	2	Rarely	11–33	22
3	Frequently	34–65	49.5	3	Occasionally	34–50	42
4	Almost Always	66–100	83	4	Frequently	51–65	58
				5	Very Frequently	66–85	75.5
				6	Usually or always	86–100	93

Table modeled after that in Asarta et al. (2021)

The slate of methods questions posed to respondents changed somewhat on the 2020 survey as well. Technological progress since 2010 meant that some methods have become obsolete (those mentioning compact discs, for example). Others have become available to instructors (Federal Reserve Economic Data [FRED] searches, online adaptive learning assignments, etc.). Besides technological changes, this iteration also asked questions concerning activities and/or lessons on diversity issues. Finally, this version opened up options for race to include all options on the U.S. Census, and also offered a non-binary choice for gender.

Relative to the 2010 survey, the 2020 version generated a higher response rate from Master's institutions, a similar response rate from Doctoral institutions, and a lower response rate from both Associate's and Baccalaureate institutions. Though a total of 1,664 economists responded to the survey, some did not respond to enough questions to be included in the dataset for this study. After removing those surveys, 1,138 remained. As Table 4.1 shows, instructors at Doctoral institutions account for just over half of the total responses for this analysis. This oversampling may bias the results toward instructors at those schools.

Replicating the variable construction methods of Schaur et al. (2012) and Harter et al. (2015) data for all variables comes directly from survey responses. The only exception is the Carnegie Classifications themselves. The classifications also serve as the independent variables. Dependent variables fall into four categories: instructional methods, assessment methods, grade category weights, and mathematical importance. Most are binary categorical variables for whether an instructor employs a particular method in any of their courses. Teaching methods variables come from a survey question asking instructors to say how often they use a particular method. Any response other than "Never" was coded as a 1. Because of the change from the response scale used in previous quinquennial surveys, the two variables for lecture frequency were constructed somewhat differently. The first is similar to the previous scale, and the other is based on the previous convention. In other words, the first is coded 1 for the responses "Very frequently" (5) or "Usually or always" (6), and a 0 otherwise. Coding it this way corresponds to responses of "Almost always" (4) on previous analyses of the quinquennial survey and allows for continuity of analysis of trends in lecture use. The second applies the convention of coding the maximum response possible, now a 6 rather than a 4, as a 1 and a 0 otherwise. Assessment method variables were generated from a survey question asking respondents to provide the percentage each method contributes to the course grade. Any response other than 0% was coded as a 1.

Besides updating the work of Schaur et al. (2012) and Harter et al. (2015), this study also extends their work by constructing two new sets of binary variables. The first set is for the grade weight of exams using multiple choice questions (75% or more of the grade and less than 50%) and for group work (10% or more of grade). The second set looks at the importance of exam questions and problems requiring various mathematical skills. The survey asked respondents to rank the importance of exam questions and problems that require numerical calculations, graphs, algebra, and calculus on a scale of 0 to 4. The first binary variables for math skill coded any response of "extremely important" as a 1 and all other responses as 0. The second coded responses of "extremely important" or "fairly important" as a 1 and all other responses 0.

Table 4.3 provides definitions and descriptive statistics for the meaningful variables in this study. Full descriptive statistics can be found in Appendix A. In addition to questions on assessment and instructional methods, the survey also invites participants to respond to questions about demographics. These variables do not appear in the model for this analysis. For a list of these variables, refer to Appendix A. For insight into their impact on teaching and assessment methods, see chapter 5. The dependent variables are the binary variables for the different methods used by instructors. Variables have been grouped just as they were on the survey: In-class Presentation, Activities, Discussion, and so on. If a respondent answered any question in the grouping, any missing response from the same group was coded as a 0. The number of observations for each group constitutes those who answered any question within that group. Statistics here are for the overall sample rather than specific types of courses (principles; intermediate theory; statistics, econometrics, and mathematic economics; and other upper-division courses).

Table 4.3. Variable Definitions and Descriptive Statistics

	N	Mean	SD
In-class Presentation Variables			
Lecture Usually or Always = 1 for a response of 5 or 6	1138	0.63	(0.48)
Lecture Usually or Always: 2020 = 1 for a response of 6		0.44	(0.50)
Chalkboard or Whiteboard Text/Graphs		0.84	(0.37)
PowerPoint or Other Computer-Generated Displays		0.83	(0.37)
Overhead Projector Displays/Document Camera		0.39	(0.49)
DVD/VCR Tapes; Films; or Movie/Internet Clips		0.62	(0.49)
Team Teaching		0.17	(0.38)
Guest Lectures		0.46	(0.50)
Discussion Variables			
Discussion: Student(s) with Student(s)	1138	0.77	(0.42)
Discussion: Instructor(s) with Student(s)		0.86	(0.35)
Clickers		0.30	(0.46)
Activities Variables			
Classroom Experiments	1138	0.35	(0.48)
Games & Simulations		0.40	(0.49)
Cooperative Learning/Small-Group Assignments		0.55	(0.50)
Computer Lab Assignments		0.29	(0.45)
Student Self-Assessments of Learning		0.16	(0.36)
Classroom Lessons/Activities that Address DEI Issues		0.14	(0.35)
Classroom Lessons/Activities that Address Gender Issues		0.13	(0.34)
References to DEI Issues		0.38	(0.48)
References to Gender Issues		0.39	(0.49)
References to Literature; Drama; or Music Lyrics		0.32	(0.47)
References to Sports		0.35	(0.48)

Table 4.3 Variable Definitions and Descriptive Statistics (continued)

Materials Variables			
Textbooks (print)	1138	0.64	(0.48)
Textbooks (online/electronic)		0.56	(0.50)
Publisher-developed Workbooks/Study Guides (print)		0.07	(0.26)
Publisher-developed Online Workbook/Tutorial Assignment		0.25	(0.43)
Adaptive Learning Assignments		0.15	(0.35)
Instructor-developed Class Notes		0.50	(0.50)
Instructor-developed Problem Sets		0.67	(0.47)
Press Readings		0.50	(0.50)
Scholarly Readings		0.53	(0.50)
Other Readings		0.06	(0.24)
Database Variables			
Federal Reserve Economic Data	1138	0.59	(0.49)
Other Government Databases		0.64	(0.48)
Literature Search Variables			
Library Holdings	1138	0.45	(0.50)
Internet Searches		0.60	(0.49)
EconLit		0.40	(0.49)
Grading Variables			
Exams with Multiple-Choice Questions	1138	0.53	(0.50)
Exams with Long-answer Essay/Questions		0.35	(0.48)
Shorter Papers		0.35	(0.48)
Other Written Assignments		0.19	(0.39)
Oral Presentations		0.36	(0.48)
Publisher-developed Online Homework Assignments		0.19	(0.39)
Publisher-developed Adaptive Assignments		0.07	(0.26)
Instructor-developed Online Quizzes and Exams		0.16	(0.37)
Exams with Short-answer Essay/Questions		0.61	(0.49)
Term Papers		0.40	(0.49)
Homework/Problem Sets		0.60	(0.49)
Class Participation		0.46	(0.50)
Performance in Games; Simulations; or Experiments		0.08	(0.27)
Instructor-developed Online Homework Assignments		0.12	(0.33)
Publisher-developed Online Quizzes and Exams		0.08	(0.26)
Uses groupwork in grade in at least one course		0.48	(0.50)
Other Grading Methods		0.06	(0.24)
Multiple Choice Exams Worth 75% or More of Grade		0.09	(0.28)
Multiple Choice Exams Worth Less than 50% of the Grade		0.70	(0.46)
Group Work Worth 10% or more of Grade		0.43	(0.50)

Table 4.3 Variable Definitions and Descriptive Statistics (continued)

Mathematical Importance Variables			
Numerical Calculations Extremely Important = 1 if *"How important are exam questions and problems that require [mathematical skill]"?* answered *"Extremely Important"*	1138	0.41	(0.49)
Calculus Extremely Important		0.18	(0.38)
Numerical Calculations Fairly or Extremely Important = 1 if *"How important are exam questions and problems that require [mathematical skill]"?* answered *"Extremely Important"* or *"Fairly Important"*		0.58	(0.49)
Graphs Fairly or Extremely Important		0.68	(0.47)
Algebra Fairly or Extremely Important		0.57	(0.50)
Calculus Fairly or Extremely Important		0.28	(0.45)

4.5 OLS for Methodological Variety across Classifications

This study employs similar analysis methods to those of Schaur et al. (2012) and Harter et al. (2015). In addition to descriptive statistics, OLS estimations are used in which dependent variables are the binary variables for whether an instructor used a particular method. The independent variables are binary categorical variables for each Carnegie Classification, with Doctoral the omitted category. The model is below.

$$\textit{Use of Method}_i = \beta_0 + \beta_1 \textit{ Associate's Institution}_i + \beta_2 \textit{ Baccalaureate Institution}_i + \beta_3 \textit{ Master's Institution}_i + \varepsilon_i$$

As Schaur et al. and Harter et al. point out, OLS is more fitting in this analysis for several reasons. First, this specification means that adding the coefficients for each Carnegie Classification to the constant term will provide the percentage of instructors using the instruction or assessment method at each type of institution. Second, running regressions with Carnegie Classification as the only independent variable eliminates the chance of collinearity issues with other institutional characteristics. Correlation coefficients for Carnegie Classifications and institutional characteristics of class size in principles courses, teaching load for tenure track faculty, and the weight of teaching on promotion and tenure decisions and raises were not as high in the data from the 2020 survey as they were in the data from 1995–2010 (the only correlation above .5 was for Doctoral and tenure-track teaching load), but they were still high enough to warrant maintaining the approach of Schaur et al. and Harter et al. Next, probit regressions would have provided non-linear transformations of the values. Finally, Schaur et al., Harter et al., and the broader work on Carnegie Classification finds a low R^2 for these estimations and past estimations of any causal impact of Carnegie Classification on methods. All of this also makes probit less ideal for the task. That low explanatory power means the primary goal of this analysis is simply to provide a picture of the methods used to teach and assess economics across classifications. Estimations are conducted at each course level.

4.6 Results

Tables for all results are too large to be replicated here and can be found in Appendix B. Results demonstrate that economics instruction and assessment methods vary in meaningful ways across Carnegie Classifications. However, as has been the case in past work, the R^2 in each regression was quite small. Generally, instructors at Associate's, Baccalaureate, and Master’s institutions are more likely to employ alternatives to chalk and talk and multiple choice exams than their counterparts at Doctoral institutions. This is especially true for methods involving student interaction or writing. The differences are widest between Baccalaureate and Doctoral institutions.

At the principles level, faculty at Doctoral institutions are more likely to lecture “almost always” (the scale used from 1995 to 2010), or “usually or always” (the scale used on the 2020 iteration), than faculty at Baccalaureate institutions.

Faculty at Associate's institutions are less likely to lecture almost always, but more likely to lecture usually or always than faculty at Doctoral institutions. For Master's faculty, the opposite is the case. For other in-class presentation variables, the coefficient for computer-generated displays is almost identical across classifications; Baccalaureate and Master's institutions are less likely to use document cameras; and all classifications are more likely to intersperse video clips or movies than faculty at Doctoral institutions. Faculty at Doctoral institutions are also less likely to incorporate discussion and more likely to incorporate clickers or similar devices. Faculty at Baccalaureate institutions are more likely than those at Doctoral to use classroom experiments, games, and cooperative learning. Faculty at the other classifications are more likely than those at Doctoral schools to include student self-assessments. The same holds true for lessons or activities on diversity and inclusion issues, but only slightly. Next, Doctoral faculty are more likely to use a textbook of any kind, less likely to use publisher-developed print workbooks, and more likely to use publisher-developed online workbooks. They are also less likely to use any sort of database or literature searches in their classes.

Grading methods also reveal differences. First, only 61% of faculty at Baccalaureate institutions employ multiple choice exams in some way in their course grades, compared to 83% and 94% respectively of Doctoral and Associate's faculty. Related, 77% of Baccalaureate faculty use exams with short essay questions, compared to less than 50% of Doctoral faculty. Baccalaureate faculty are also more likely to assign homework/problem sets, but less likely to assign publisher-developed online homework. Doctoral faculty are less likely than those at other universities to assign any of the methods that involve writing, participation, or performance in games or simulations. They are also more likely to set the weight of multiple-choice exams at 75% or more of their course grades, and less likely to make group work worth more than 10%.

The gap between Doctoral and other institutions is most clear in intermediate courses. In their teaching methods faculty at Doctoral institutions are most likely to lecture “almost always” or “usually always,” and make the greatest use of online textbooks, adaptive learning assignments, and instructor-developed class notes. They make the least use of chalkboards/whiteboards, discussion, cooperative learning, self-assessments, print textbooks and workbooks, scholarly readings, databases, and literature searches of all kinds. While the 2010 iteration of the survey showed a remarkable similarity in grading methods at the intermediate course level, this iteration shows much greater variety. The prominence of writing in almost all forms, oral presentations, participation, performance in games and simulations, and group work continues for faculty at Baccalaureate and Master’s institutions. In a reversal of trend, intermediate is the only level where Doctoral faculty are least likely to use exams with multiple choice questions. Master’s faculty are the outlier on instructor-developed problem sets, using them less than the other classifications. Baccalaureate faculty are the outlier on making group work worth 10% or more of the course grade.

In statistics, econometrics, and math economics courses, Baccalaureate faculty are least likely to “almost always” or “usually or always” lecture and most likely to employ chalkboards and discussion, but the gap is much smaller in statistics and econometrics than in other courses. Faculty at Baccalaureate schools are still most likely to use cooperative learning, but unlike in other courses, Master’s faculty are the least likely to. Also, unlike the other levels, in statistics and econometrics courses

Baccalaureate faculty are less likely to use either online or print textbooks. Baccalaureate and Master's faculty are less likely to use instructor-developed class notes, with Master's almost 30 percentage points less likely. Both classifications are more likely to use databases, literature searches, and press readings, with Baccalaureate almost thirty percentage points more likely to include scholarly readings. Baccalaureate faculty continue to be more likely to employ grading methods involving writing or presentations, and though the use of group work at this level is similar across classifications, Baccalaureate faculty are still much more likely to include group work as 10% or more of the course grade.

Most of the trends established so far continue in upper-division courses. However, the magnitudes of the differences have become more pronounced for some methods. For example, Baccalaureate faculty are between 26 and 29 percentage points less likely to "almost always" or "usually or always" employ lecture compared to Doctoral faculty. They are also 24 percentage points more likely to use shorter papers and 18 percentage points more likely to use term papers, the greatest differences in use across the course types. One pattern appeared across all types of courses: Baccalaureate faculty are more likely to include lessons, activities, and references that deal with diversity, inclusion, or gender issues.

In addition to looking at differences among the schools, there are some differences between the 2010 and 2020 findings worth noting. At the principles level all four classifications have seen an almost 30 percentage point drop from 2010 in use of exams with essay questions. Doctoral faculty have decreased their use of exams with short answer questions by 16 percentage points, while the other classifications have remained relatively the same. Baccalaureate faculty have increased their use of homework by 10 percentage points. Associate's faculty are now much less likely than the other classifications to use classroom experiments. References to literature, drama, and music have fallen in Principles courses across classifications, and Baccalaureate and Master's faculty now incorporate them less than Doctoral faculty. Doctoral faculty also show a slight increase in their inclusion of participation in the course grade. Master's faculty have increased their use of oral presentations. Associate's faculty have reduced their use of performance in games and experiments in course grades. Finally, the past 10 years have experienced almost a 10-percentage point increase in the use of homework across Carnegie Classifications.

At the intermediate level, Master's faculty have joined Baccalaureate faculty in indicating that they are less likely to usually or always lecture, relative to Doctoral faculty. Faculty at Doctoral institutions have gone from employing cooperative learning at a frequency of 39% to one of 57%, and classroom experiments from 29% to 35%, bringing them level with Master's faculty in both methods. Faculty at all classifications have dramatically reduced their use of exams with longer essay questions by almost 30 percentage points, and Doctoral faculty have reduced their use of exams with short essay questions by approximately 10 percentage points. All classifications have increased their use of term papers, with Baccalaureate faculty doing so by approximately 15 percentage points. Doctoral faculty have slightly lessened their use of term papers, while Baccalaureate faculty have slightly increased theirs. Doctoral faculty have increased their use of oral presentations and class participation as well.

In statistics and econometrics courses, Doctoral faculty's indication of lecturing "usually or always" has declined, and is now just under that of faculty at

Master's institutions. Baccalaureate faculty have increased their use of cooperative learning, as have Doctoral faculty, enough that they now surpass Master's in this method. Use of classroom experiments by Baccalaureate faculty declined by more than 10 percentage points, and references to sports have declined across all classifications. Each classification has increased its use of exams with multiple choice questions and decreased use of exams with essay questions. The magnitude of those changes is approximately equal, by at least 10 percentage points in both cases. Doctoral faculty have decreased their use of short-answer exam questions.

Finally, in upper division courses Baccalaureate and Master's faculty still indicate being less likely to lecture usually or always. For Baccalaureate faculty that likelihood has decreased by almost 20 percentage points. Faculty across classifications have increased their use of cooperative learning by at least 10 percentage points, as well as showing modest increases in the use of classroom experiments. Use of multiple-choice questions on exams has remained more or less constant, but use of longer essay questions has declined by almost 35 percentage points. All classifications have also increased their use of homework by almost 15 percentage points. Doctoral faculty have decreased their inclusion of term papers by approximately 10 percentage points. Baccalaureate faculty have increased their use of shorter papers by 10 percentage points. Last, the use of oral presentations has increased for Doctoral faculty by almost 10 percentage points and for Baccalaureate by almost 20.

4.7 Discussion

Despite clear differences in teaching and assessment among Carnegie Classification, the explanatory value of Carnegie Classification is as minimal here as it has been in previous work. Just as in Schaur et al. (2012) and Harter et al. (2015), the

R^2 for all regressions is low, and all constants are statistically significant. This means there is far more behind these differences across classifications than the classifications themselves. It's possible that educational background exerts an influence. Previous research has found that students who earned a Ph.D. in economics but completed their undergraduate degree at a liberal arts college had higher verbal Graduate Record Exam (GRE) scores than other Ph.D. economics students (Siegfried & Stock, 2007). Related, about a third of the faculty at top economics programs came from B.A. programs in schools with top economics programs. In other words, those faculty with liberal arts backgrounds may simply have a comparative advantage in implementing methods that involve or require verbal skills in their students, and may themselves be working at liberal arts colleges. Background may also make a difference in whether one received any kind of training in teaching while a graduate student. Graduates from top 30 economics programs were less likely to have received any kind of training than their colleagues at schools ranked 31st to 132nd. A similar gap marks the training of new economics faculty (Allgood, Hoyt, & McGoldrick, 2018). Including a question on future iterations of the survey not only about highest degree earned but also educational path could help to explore these relationships.

The explanatory power of classification may also be obscured by the opportunistic nature of the sample. A broader response base may begin to accentuate even further the differences at different types of schools. The binary nature of these variables may also be hiding a causal relationship. Looking at the likelihood of using a method more or less often instead may reveal more than simply looking at its use at all. Also, the differences in the use of computer-generated displays vs. overheads, and online vs. print textbooks raises the possibility of an impact of school size on funding, or at least the allocation of resources for the adoption of new technologies. The adoption of and advance of technology may also explain the decline in writing across classifications since the 2010 survey. As exams with multiple choice questions become easier to construct and grade, the opportunity cost grows of assigning even short-answer essay questions.

Table 4.4 includes medians and means of class sizes for all course levels at all Carnegie Classifications. As one might expect, class size medians and means are

Table 4.4. Class Size Medians and Means by Carnegie Classification

	N	Median	Mean	SD
Associate's Institutions				
Class size: Principles	16	22.50	24.19	(8.80)
Class size: Intermediate Theory	3	30.00	21.67	(18.93)
Baccalaureate Institutions				
Class size: Principles	148	29.00	30.30	(9.11)
Class size: Intermediate Theory	91	25.00	24.34	(11.39)
Class size: Statistics and Econometrics	72	20.00	22.18	(10.10)
Class size: Other Upper-Division Courses	157	19.00	18.50	(5.72)
Master's Institutions				
Class size: Principles	166	35.00	46.95	(32.36)
Class size: Intermediate Theory	97	25.00	27.35	(18.32)
Class size: Statistics and Econometrics	56	25.00	25.88	(10.50)
Class size: Other Upper-Division Courses	146	25.00	24.38	(11.21)
Doctoral Institutions				
Class size: Principles	280	80.00	158.96	(184.14)
Class size: Intermediate Theory	164	40.00	59.91	(68.92)
Class size: Statistics and Econometrics	140	30.00	36.20	(21.56)
Class size: Other Upper-Division Courses	359	30.00	38.48	(27.62)

higher for Doctoral institutions than they are for all others. This raises the question of whether methodological choices are more related to class size than to the type of institution. However, in a series of probit regressions yielding marginal effects estimates, Chapter 5 shows that type of institution was significant far more often than class size. Also, the correlation coefficients for Carnegie Classification and class sizes in principles courses are not higher than .5 for any classification, and above .4 only for Doctoral institutions. It is possible, as Kuh and Hu (2001) argued, that class size and methods are both functions of institutional mission, rather than the former impacting the latter. The causal relationships of these variables is an area for further research. Carnegie Classifications may have a limited impact on student outcomes because they don't capture differences in mission, programs, or other institutional characteristics very well. In other words, the Classifications may contain too much heterogeneity within each category. Thus, institutional effects will not appear in a pronounced way. If this is correct, then the value of the Carnegie system may be "more heuristic than explanatory" (McCormick et al., 2009, p. 163). Even if this is the case, Carnegie Classification does have an effect on institutional behavior, and clearly there are differences between the ways schools of varying classifications assess and teach economics. The more important analysis then may not be institutional type but institutional culture. As McCormick, Pike, Ku, and Chen (2009) argue, "Among the more important institutional factors influencing student engagement and learning are an institutional ethos that values undergraduate education, widespread, intentional use of empirically verified practices in undergraduate education, and widespread use of promising educational practices" (p. 147).

Whatever the level of the explanatory benefit of Carnegie Classification for instructors' choices of methods, the question at the heart of this study is whether undergraduate economics instruction and assessment differ across classifications. The answer is yes, they do. That difference is greatest for Doctoral institutions relative to the others. On a practical policy level, there are two straightforward measures available to departments and departmental leadership. First, adjust tenure and promotion standards to reward good teaching and adoption of methodological variety. This of course would require implementation in practice, not just on paper. Unfortunately, as Wilkesmann and Schmid (2014) report, "…[T]eaching is said to be the professoriate's neglected stepchild" (p. 6). As economist Russ Roberts has said on his podcast, the notion that promotion at doctoral universities is based on both research and teaching is "pretend" (Roberts, 2021). However, if the way an academic economist spends one's time is largely a matter of incentives and preferences (Gautier & Wauthy, 2007), then there is potential for change.

The second policy measure involves implementing better training for graduate students, and perhaps even for current faculty. Forrest (2002) reports that across academia a satisfactory view of one's training in teaching was highly correlated with preferring teaching to research. Unfortunately, the picture of the state of preparation—schools that include training before one starts teaching, feelings of preparedness for the classroom, availability of professional development, etc.—is unflattering to say the least (Allgood, Hoyt, & McGoldrick, 2018; Allgood & Walstad, 2013; McGoldrick, Hoyt, and Colander, 2010; Walstad & Becker, 2010). However, quality training can be both effective and viewed positively by participants (Walstad & Salemi, 2011). Therefore, institutions that want to see meaningful change in the quality and variety of teaching have reason to hope. The question of training also provides an area for future research. One simple step in this direction would be to add a question to future iterations of the quinquennial survey that asks participants to rate their satisfaction with their teaching preparation.

There are limitations to this study. First, the sample here is opportunistic and probably does not represent the discipline as a whole. In fact, the intuition with past research based upon the quinquennial survey has been that those who fill out the survey are those who have an interest in their teaching. If this is the case, actual methodological variety is much less pronounced. The potential oversampling could also be biasing results. Finally, as noted above the R^2 for Carnegie Classification and teaching and assessment methods is quite small. Exploring other explanatory variables is an opportunity for future research.

The Carnegie Classification System has an empirically substantiated impact on the academic landscape and institutional behaviors, which themselves influence instructor decisions about teaching and assessment. Knowing the extent of that impact in 2020, and specifically in regard to the instruction and assessment methods employed in Economics departments, will allow administrators and faculty to more fully evaluate their work, reputation, decisions, and mission. That kind of evaluation could yield benefits for students, faculty, departments, and the discipline as a whole.

Chapter 5

GENDER DIFFERENCES IN INSTRUCTION AND ASSESSMENT METHODS IN COLLEGIATE ECONOMICS

5.1 Introduction

A wide body of work examines the benefits of employing pedagogy more varied than simply chalk and talk (e.g., Hiebert & Grouws, 2007; Hiebert et al., 2005), and yet in economics those methods continue to dominate (Asarta, Chambers, & Harter, 2021). There is even evidence to suggest that they are dominant to an extent not experienced in other disciplines (Bayer & Rouse, 2016; Saunders, 2001; Webber & Rogers, 2018). One contribution to this teaching gap is that at least a third of economists still believe lecture is the best method of delivery, despite ample pedagogical research on the benefits of active learning and other research-based instructional strategies (Goffe & Kauper, 2014). Given this situation, this study seeks to explore the variables that predict a wider variety of teaching methods, with a particular focus on instructor gender.

Using data from the Sixth National Quinquennial Survey on Teaching and Assessment Methods in Undergraduate Economics, this study derives marginal effects estimates from probit regression models to examine the instruction and assessment methods female faculty are more likely to employ than their male colleagues. Findings on this front are consistent with those of Schaur, Watts, and Becker (2012) and Harter, Schaur, and Watts (2015). This study differs from the Schaur et al. and Harter et al. research in some significant ways. First, their research made use of the 1995, 2000, 2005, and 2010 iterations of the quinquennial surveys, whereas this study will derive its analysis from the 2020 survey only. Second, they looked at institutional, departmental, and instructor determinants of methods. This study looks primarily at instructor determinants and focuses on instructor gender. Third, their studies employed a narrower set of variables. This study includes as dependent variables all instruction and assessment methods about which the survey asked.

This study also extends the previous work on the demographics behind economics instruction and assessment by exploring three sub-questions that previous analysis of quinquennial survey data did not. First, research still finds little to no gender bias in the use of multiple-choice exams. However, the idea persists that men perform better on multiple choice exams and women on questions that allow for more creativity or reward verbal skills (Griselda, 2021). This study therefore adds a binary variable to explore a connection between professor gender and weighting multiple choice exams by 75% or more of the course grade and one for weighting multiple choice exams by 50% or more of the course grade. Second, previous research has also found a relationship between female persistence in economics and the level of mathematical aptitude required in introductory economics courses (Feigenbaum, 2013; Ahlstrom & Asarta, 2019). Given these findings, this study adds a group of binary variables to test a connection between professor gender and the level of importance instructors place on exam questions and problems that require numerical calculations, algebra, graphs, and/or calculus. Finally, women also show a stronger preference for working with others rather than alone (Dickens & Sagaria, 1997; Kessler, Spector, & Gavin, 2014). Therefore, in addition to the categorical variable for whether an instructor includes group work in calculating the course grade, this study adds a categorical variable for an instructor weighting group work at 10% or more of the course grade.

Decisions about instruction and assessment methods arise from many factors. Class size, institutional characteristics, the time costs of planning or grading, and more play a part. Previous research has found instructor demographics—gender among them—to exert an influence as well (Schaur et al., 2012; Harter et al., 2015). Given the research on the difference between the ways men and women experience the discipline of economics, this is not a surprise (see Ahlstrom & Asarta, 2019; Ashworth & Evans, 1999; Dupas, Modestino, Niederle, & Wolfers, 2021; Goldin, Guerrieri, & Voena, 2019). This study will seek primarily to answer the question of whether the impact of instructor gender revealed by the 2010 iteration of the quinquennial survey has persisted. If gender does make a difference, this finding would invite a host of additional questions related to the gender gap in economics and could play a role in mitigating that gap in terms of both numbers of women in the economics discipline and the ways they experience it.

5.2 Data and Sample

As with the other essay chapters in this dissertation, the data for this analysis comes from the 2020 administration of the Sixth National Quinquennial Survey on Teaching and Assessment Methods in Undergraduate Economics. Also as described elsewhere (see section 4.4), minor changes were made to the survey for the 2020 iteration related to the scale of methods questions, technological change, and some demographic questions. Invitations to complete the 2020 survey were delivered via email and survey responses gathered in electronic format only. A summary of the number of survey invitations emailed, response rates by Carnegie Classification, and the number of surveys included in the analysis for this chapter appear in Table 5.1.

Table 5.1. Survey Invitations and Complete Responses by Carnegie Classification

Carnegie Classification	**Emailed invitations**	**Surveys in this study**
Associate's	349	18
Baccalaureate	2,073	252
Master's	2,595	248
Doctoral	6,527	620
Total	**11,544**	**1,138**

One important difference between the 2020 version and all previous iterations of the quinquennial survey is the scale available to participants. For instructional methods questions Becker and Watts (1995) employed a non-linear scale of 0–4, and subsequent iterations used that scale as well. To provide more precision to the results, the current survey offered a 0–6 scale for methods questions. For grading methods, the survey does not ask instructors how often they use a particular method. Instead, instructors are asked to indicate the percentage weight of the course grade that comes from each method. The scale for the questions on the importance of problems and exam questions requiring certain mathematical skills also differed from the scale for teaching methods. Respondents were given the choices of "0, Not at all important"; "1, Somewhat important"; "2, Important"; "3, Fairly important"; or "4, Extremely important." The slate of methods questions posed to respondents changed somewhat on the 2020 survey as well. Technological progress since 2010 meant that some methods have become obsolete (those mentioning compact discs, for example). Others have become available to instructors (Federal Reserve Economic Data [FRED] searches, online adaptive learning assignments, etc.). Besides technological changes, this iteration also asked questions concerning activities and/or lessons on diversity issues. Finally, this version opened up options for race to include all options on the U.S. Census, and also offered a non-binary choice for gender[3].

Relative to the 2010 survey, the 2020 version generated a higher response rate from Master's institutions, a similar response rate from Doctoral institutions, and a lower response rate from both Associate's and Baccalaureate institutions. Though a total of 1,664 economists responded to the survey, some did not respond to enough questions to be included in the dataset for this study. After removing those surveys, 1,138 remained. As Table 5.1 shows, instructors at Doctoral institutions account for just over half of the total responses for this analysis. This oversampling may bias the results toward instructors at those schools.

Replicating the variable construction methods of Schaur et al. (2012) and Harter et al. (2015), data for all variables comes directly from survey responses except for the Carnegie classifications themselves. Most dependent variables are binary categorical variables for whether an instructor employs a particular method. Teaching methods variables come from a survey question asking instructors to indicate how often they use a particular method. Any response other than "Never" was coded as a 1. Because of the change from the response scale used in previous quinquennial surveys,

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[3] Only three respondents returned an answer of "non-binary" on that particular question.

the two variables for lecture frequency were constructed somewhat differently. The first is similar to the previous scale, and the other is based on the previous convention. In other words, the first is coded 1 for the responses “Very frequently” or “Usually or always,” and a 0 otherwise. Coding it this way corresponds to responses of “Almost always” on previous analyses of the quinquennial survey and allows for continuity of analysis of trends in lecture use. The second applies the convention of coding the maximum response possible, now a 6 rather than a 4, as a 1 and a 0 otherwise. Grading method variables come from a survey question asking respondents to provide the percentage each method contributes to the course grade. Any response other than 0% is coded as a 1.

In addition to the variables for teaching and assessment methods, the dataset also includes the new variables mentioned above for weight of multiple-choice exams, weight of group work, and the importance of problems and exam questions that require certain math skills. For multiple choice weight, both variables were coded a 1 if an instructor responded with a weight at or above the threshold, and a 0 otherwise. Besides being natural dividing lines, weighting multiple choice at 75% of the grade puts an instructor in the 90th percentile at all course levels and weighting them 50% in the 75th percentile at all course levels. The variable for group work weight was coded as a 1 if an instructor weighted group work 10% or more of the course grade, and 0 otherwise. The 10% threshold puts an instructor in the 50th percentile for all course levels. For math skill importance, two binary categorical variables were created, one for the highest rating of “Extremely important,” and one a rating of “Extremely or fairly important.” Both variables were coded a 1 if an instructor responded with an importance at or above the threshold, and a 0 otherwise.

The dependent variables are the binary variables for the different methods used by instructors. The independent variables come from survey questions regarding individual demographics, school or department characteristics, and class size. The independent variables are both continuous and categorical. In keeping with past work, teaching load is an institutional variable, not an individual one. The survey asks for tenure track teaching load and non-tenure track teaching load rather than a combined average. Rather than incorporate both variables in the model for this analysis, for the sake of simplicity only tenure track teaching load is included. Regressions were run in the groups in which variables appeared on the survey (In-class Presentation, Activities, Grading, etc.). If a respondent answered any question in the group, any missing response from the same group was coded as a 0. Table 5.2 provides definitions and descriptive statistics for dependent variables. Only dependent variables for which the marginal effect estimate for Female was significant are included there. Full descriptive statistics can be found in Appendix A.

Focusing on methods, it is important to note that means in the descriptive statistics are for binary variables, not for frequency of use (for more on frequency see Asarta et al., 2021, Harter & Asarta, 2022; and Harter et al., 2022). Still, lecture, chalkboards, and PowerPoint continue as dominant instructional methods. More instructors in this sample also employ student-to-student and instructor-to-student discussion than do not. Cooperative learning is used by just over half the sample at some point, but less than half employ games, simulations, or classroom experiments.

Table 5.2. Descriptive Statistics for Significant Dependent Variables

	N	Mean	SD
In-class Presentation Variables			
Lecture Usually or Always = 1 for a response of 5 or 6	1138	0.63	(0.48)
Lecture Usually or Always (2020) = 1 for a response of 6		0.44	(0.50)
DVD/VCR Tapes; Films; or Movie/Internet Clips		0.62	(0.49)
Guest Lectures		0.46	(0.50)
Discussion Variables			
Discussion: Student(s) with Student(s)	1138	0.77	(0.42)
Discussion: Instructor(s) with Student(s)		0.86	(0.35)
Activities Variables			
Cooperative Learning/Small-Group Assignments	1138	0.55	(0.50)
Computer Lab Assignments		0.29	(0.45)
Student Self-Assessments of Learning		0.16	(0.36)
Classroom Lessons or Activities that Address Gender Issues		0.13	(0.34)
References to Gender Issues		0.39	(0.49)
References to Literature; Drama; or Music Lyrics		0.32	(0.47)
References to Sports		0.35	(0.48)
Materials Variables			
Press Readings	1138	0.50	(0.50)
Scholarly Readings		0.53	(0.50)
Database Variables			
Other Government Databases		0.64	(0.48)
Literature Search Variables			
Library Holdings	1138	0.45	(0.50)
Internet Searches		0.60	(0.49)
EconLit		0.40	(0.49)
Grading Variables			
Exams with Multiple-Choice Questions	1138	0.53	(0.50)
Shorter Papers		0.35	(0.48)
Oral Presentations		0.36	(0.48)
Term Papers		0.40	(0.49)
Class Participation		0.46	(0.50)

Table 5.2 Descriptive Statistics for Significant Dependent Variables (continued)

Uses groupwork in grade in at least one course		0.48	(0.50)
Other Grading Methods		0.06	(0.24)
Multiple Choice Exams Worth 75% or More of Grade = 1 if multiple choice exams weighted at 75% of course grade or higher		0.09	(0.28)
Multiple Choice Exams Worth 50% or More of Grade = 1 if multiple choice exams weighted at 50% of course grade or higher		0.24	(0.43)
Multiple Choice Exams Worth Less than 50% of the Grade = 1 if multiple choice exams weighted at less than 50% of course grade		0.70	(0.46)
Group Work Worth 10% or more of Grade = 1 if group work weighted 10% or more of course grade		0.43	(0.50)
Mathematical Importance Variables			
Numerical Calculations Extremely Important = 1 if *"How important are exam questions and problems that require [mathematical skill]"?* answered *"Extremely Important"*	1138	0.41	(0.49)
Graphs Extremely Important		0.54	(0.50)
Algebra Extremely Important		0.39	(0.49)
Calculus Extremely Important		0.18	(0.38)
Numerical Calculations Extremely or Fairly Important = 1 if *"How important are exam questions and problems that require [mathematical skill]"?* answered *"Extremely Important"* or *"Fairly Important"*		0.58	(0.49)
Graphs Fairly or Extremely Important		0.68	(0.47)
Algebra Fairly or Extremely Important		0.57	(0.50)
Calculus Fairly or Extremely Important		0.28	(0.45)

For grading methods, more than half the sample make use of exams with multiple choice questions, and more than half make use of problem sets. Less than half make use of writing assignments of any kind of length, though more than half include short essay or short answer exam questions. These proportions serve as a reminder that though multiple choice questions continue to be prevalent, multiple choice and short essay questions are not mutually exclusive.

Table 5.3 includes descriptive statistics for all independent variables. Most respondents are male, teach at a doctoral institution, and speak English as a first language. The mean for years of experience is a little over 18 years. The rank most represented in the sample is full professor.

Table 5.3. Descriptive Statistics for Independent Variables

Variable	N	Mean	SD
Female = 1 for faculty indicating gender as female	871	0.36	(0.48)
Lecturer/Instructor/Adjunct = 1 for faculty with rank of lecturer, instructor, or adjunct	856	0.13	(0.34)
Assistant Professor = 1 for faculty with rank of assistant professor	856	0.24	(0.43)
Associate Professor = 1 for faculty with rank of associate professor	856	0.21	(0.41)
Full Professor = 1 for faculty with rank of full professor or named/endowed chair	878	0.40	(0.49)
English as second language indicator variable = 1 for faculty who do not speak English as a first language	874	0.18	(0.38)
Doctoral indicator variable = 1 for Doctoral institutions	1138	0.54	(0.50)
Master indicator variable = 1 for Master’s institutions	1138	0.22	(0.41)
Baccalaureate indicator variable = 1 for Baccalaureate institutions	1138	0.22	(0.42)
Associate indicator variable = 1 for Associate’s institutions	1138	0.02	(0.12)
Proteach: Weight in percentage of teaching on decisions of promotion and tenure	864	33.36	(23.90)
Experience	832	18.19	(12.72)
Tenure-track teaching load	801	4.82	(1.74)
Class size: Principles	610	93.73	(139.63)
Class size: Intermediate Theory	355	41.57	(51.03)
Class size: Statistics and Econometrics	268	30.28	(18.22)
Class size: Other Upper-Division Courses	663	30.58	(22.94)

To aid in the focus on female academic economists, Table 5.4 provides a breakdown of professor gender by Carnegie Classification. Female faculty are outnumbered by their male colleagues in the sample by approximately a two-to-one margin. However, the proportion of females is almost identical across Carnegie Classifications.

Table 5.4. Gender Breakdown by Carnegie Classification

Female	*Doctoral*	*Master's*	*Baccalaureate*	*Associate's*	*Total*
0	313	119	116	10	558
1	166	67	74	6	313
Total	479	186	190	16	871
Proportion female	35%	36%	39%	38%	

5.3 Methods

Because of their use of previous iterations of the quinquennial survey, this analysis follows the methods of Schaur et al. (2012) and Harter et al. (2015). Both of those studies employ a probit model to explore the variables that predict the use of specific instructional and assessment methods. The probit regression model includes individual demographic attributes and institutional characteristics as independent variables. The probit model is below. *Yi* is the likelihood of employing a method or belonging to the group above the weight or importance threshold.

$$
\begin{aligned}
Y_i = \; & \beta_0 + \beta_1\, Female_i + \beta_2\, Lecturer, Instructor, Adjunct_i + \beta_3\, Assistant\ Professor_i \\
& + \beta_4\, Associate\ Professor_i + \beta_5\, ESL_i + \beta_6\, Associate's\ Institution_i \\
& + \beta_7\, Baccalaureate\ Institution_i + \beta_8\, Master's\ Institution_i \\
& + \beta_9\, Weight\ of\ Teaching\ in\ Promotion\ and\ Tenure_i + \beta_{10}\, Years\ Teaching_i \\
& + \beta_{11}\, Tenure\text{-}track\ Teaching\ Load_i + \beta_{12}\, Classsize_i \\
& + \beta_{13}\, Weight\ of\ Teaching\ in\ Promotion\ and\ Tenure^2{}_i + \beta_{14}\, Years\ Teaching^2{}_i \\
& + \beta_{15}\, Tenure\text{-}track\ Teaching\ Load^2{}_i + \beta_{16}\, Classsize^2{}_i + \varepsilon_i
\end{aligned}
$$

The demographic variables include categorical variables for professor gender, rank, and Carnegie classification. The omitted variable for rank is full professor. The omitted variable for Carnegie classification is Doctoral institution. There is also a continuous demographic variable for years of experience. There are continuous institutional variables for the weight of teaching in promotion and tenure decisions at one's institution, tenure-track teaching load at one's institution, and class size. The model also includes squared terms for the continuous variables to control for any non-linear effects. The class size variable depends on the level of the course. The primary demographic variable of interest for this analysis is Female.

Because the probit regression can only indicate the direction of the relationship between variables, regression results are used to generate marginal effects estimates to better determine the magnitude of the effect of each independent variable. Marginal effects arise from the mean values of the continuous variables, along with a squared term to account for any non-linear effects. For the categorical variables, marginal effects come from discrete changes (Becker & Kennedy, 1992). Each categorical variable has a median value of zero, so zero serves as the base value and marginal effects illustrate the difference in probability arising from a change in the variable from zero to one. Intermediate economics, econometrics, and upper division courses are minimal or absent from Associates schools, so the Associates variable was removed from analysis at those levels[4]. Empty probit coefficients arose in regressions for other variables, particularly for some variables for statistics and econometrics

[4] Including the binary categorical variable for Associate's in these regressions did not generate significant differences in the results.

courses. This same strategy was applied there. A collinearity check revealed no variables of concern.

5.4 Results

Tables 5.5 and 5.6 include results for regressions where the marginal effects estimate for Female was significant (full tables are available in Appendix C). To summarize the major findings in teaching methods, compared to their male colleagues, female faculty are between 15 and 21 percentage points less likely to lecture "almost always" (as measured in previous iterations of the survey) in principles, intermediate, and other upper-division courses. They are between 13 and 22% percent less likely to lecture "usually or always" (a 6 on the 2020 version) across all levels of courses. They are between 9 and 14 percentage points more likely to use student-to-student discussion in principles, intermediate, and other upper-division courses, and 3 and 14 percentage points more likely to use student-to-teacher discussion in all courses. Female instructors show between 21 and 27 percentage points higher a likelihood of employing cooperative learning in all courses. They also show an 8–9 percentage point higher likelihood of employing self-assessments in principles and other upper division courses. Finally, they have between an 11 and 21 percentage point higher likelihood of including press readings in their courses at all levels.

On grading variables, female faculty are between 14 and 26 points more likely to include group work in the calculation of course grades at all levels. They are also between 10 and 16 percentage points more likely to include participation in the grade at all levels but statistics/econometrics. Next, they are 6 percentage points more likely to include oral presentations in principles courses, and 13 percentage points more likely to include them in other upper division courses. Finally, though marginal effects

Table 5.5. Probit Marginal Effects Estimates: Principles

Principles	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof	ESL	Assoc.	Bacc.	Master's	Proteach	Exp.	TT Load	Class Size
In-Class Presentation N=509												
Lecture usually or always	-0.151**	-0.042	-0.039	-0.099	-0.044	-0.067	-0.030	0.077	-0.005	0.002	-0.137*	0.000
	(0.047)	(0.083)	(0.080)	(0.060)	(0.058)	(0.188)	(0.057)	(0.050)	(0.003)	(0.008)	(0.060)	(0.000)
Lecture usually or always: 2020 Scale	-0.222**	-0.112	-0.030	-0.111	0.012	0.182	-0.026	0.052	-0.007*	-0.001	-0.136**	0.000
	(0.047)	(0.095)	(0.093)	(0.068)	(0.065)	(0.183)	(0.070)	(0.067)	(0.003)	(0.009)	(0.046)	(0.001)
Movie or video clip use	0.118*	0.091	0.099	0.008	0.073	-0.132	-0.002	0.050	-0.001	0.018	0.037	0.000
	(0.046)	(0.089)	(0.084)	(0.068)	(0.064)	(0.183)	(0.067)	(0.067)	(0.003)	(0.010)	(0.049)	(0.000)
Guest lectures	0.092*	-0.004	0.114	-0.064	0.027	-0.103	-0.020	-0.001	-0.001	0.012	-0.018	0.001
	(0.045)	(0.074)	(0.082)	(0.051)	(0.056)	(0.127)	(0.054)	(0.055)	(0.003)	(0.007)	(0.033)	(0.000)
Discussion N=512												
Student-to-student Discussion	0.117**	0.045	-0.001	-0.043	-0.020		0.072	-0.065	-0.001	-0.014*	-0.123	-0.000
	(0.037)	(0.060)	(0.074)	(0.055)	(0.054)		(0.045)	(0.061)	(0.003)	(0.007)	(0.068)	(0.000)
Activities N=495												
Cooperative Learning	0.211**	-0.007	-0.037	-0.026	0.052	-0.287	0.108	-0.093	0.001	0.005	0.104	0.000
	(0.045)	(0.093)	(0.095)	(0.069)	(0.068)	(0.178)	(0.068)	(0.070)	(0.003)	(0.010)	(0.064)	(0.000)
Self-assessments	0.090*	0.033	0.040	0.016	0.013	0.149	0.032	0.003	0.000	0.004	0.029	0
	(0.038)	(0.058)	(0.059)	(0.041)	(0.038)	(0.170)	(0.042)	(0.039)	(0.002)	(0.005)	(0.038)	(0.000)
References to Literature, Drama, or Music	-0.101*	0.048	0.061	0.031	-0.227**	0.200	-0.036	-0.007	0.006	0.009	-0.067	0.001
	(0.048)	(0.091)	(0.091)	(0.068)	(0.058)	(0.177)	(0.067)	(0.067)	(0.003)	(0.009)	(0.068)	(0.000)
References to Sports	-0.239**	-0.080	-0.142	-0.114	-0.245**	0.21	-0.021	0.132*	0.000	-0.018*	-0.052	-0.000
	(0.048)	(0.091)	(0.090)	(0.067)	(0.067)	(0.115)	(0.065)	(0.058)	(0.003)	(0.009)	(0.062)	(0.000)
Materials N=511												
Press Readings	0.160**	-0.024	0.040	0.061	-0.073	-0.147	0.070	0.043	-0.000	0.007	-0.001	-0.000
	(0.046)	(0.090)	(0.089)	(0.069)	(0.064)	(0.190)	(0.067)	(0.066)	(0.003)	(0.009)	(0.043)	(0.000)

Table 5.5. Probit Marginal Effects Estimates: Principles (continued)

Databases N=512												
Other Government Databases	0.103*	0.012	0.146	0.019	0.037	0.388**	0.113	0.162*	0.004	0.008	-0.004	0.001
	(0.050)	(0.093)	(0.089)	(0.069)	(0.066)	(0.142)	(0.067)	(0.067)	(0.003)	(0.009)	(0.092)	(0.000)
Grading N=513												
Oral Presentations	0.059*	-0.022	0.072	0.022	0.054	-0.018	0.014	0.026	-0.000	-0.000	0.001	-0.000
	(0.027)	(0.025)	(0.045)	(0.025)	(0.035)	(0.045)	(0.025)	(0.026)	(0.001)	(0.003)	(0.015)	(0.000)
Class Participation	0.160**	0.144	0.158	-0.003	0.027	0.077	0.042	0.039	0.004	-0.003	-0.006	0.000
	(0.048)	(0.087)	(0.087)	(0.062)	(0.060)	(0.192)	(0.062)	(0.062)	(0.003)	(0.008)	(0.039)	(0.000)
Group Work	0.136**	0.037	0.105	0.043	0.097	0.245	0.079	-0.026	-0.000	0.011	-0.010	-0.001
	(0.044)	(0.075)	(0.077)	(0.053)	(0.058)	(0.195)	(0.056)	(0.048)	(0.002)	(0.006)	(0.045)	(0.000)
Multiple-choice Exams worth 75% or more of semester grade	-0.158**	-0.081	-0.144	-0.013	0.042		-0.187**	0.005	-0.001	0.006	0.043	0.003**
	(0.049)	(0.074)	(0.077)	(0.067)	(0.075)		(0.057)	(0.064)	(0.003)	(0.009)	(0.068)	(0.001)
Multiple-choice Exams worth less than 50% of semester grade	0.140**	0.132	-0.005	0.005	-0.091	0.011	0.321**	0.080	0.005	-0.008	-0.077	-0.002**
	(0.051)	(0.093)	(0.094)	(0.071)	(0.066)	(0.177)	(0.061)	(0.066)	(0.003)	(0.010)	(0.045)	(0.000)
Group work worth more than 10% of semester grade	0.115**	0.041	0.083	0.059	0.088	0.106	0.063	0.036	-0.000	0.008	-0.003	-0.000
	(0.038)	(0.059)	(0.062)	(0.042)	(0.048)	(0.157)	(0.044)	(0.040)	(0.002)	(0.005)	(0.032)	(0.000)
Math Importance N=512												
Graphs Extremely Important	0.125**	0.012	0.073	0.041	0.002	0.228	0.095	-0.022	-0.001	0.005	0.148*	0.000
	(0.046)	(0.089)	(0.091)	(0.068)	(0.066)	(0.152)	(0.065)	(0.067)	(0.003)	(0.009)	(0.065)	(0.000)
Graphs Fairly or Extremely Important	0.095**	-0.003	0.020	-0.099	-0.018	0.002	0.064	0.049	0.004	0.007	-0.070	-0.000
	(0.032)	(0.070)	(0.063)	(0.060)	(0.056)	(0.120)	(0.045)	(0.042)	(0.003)	(0.007)	(0.044)	(0.000)

Standard errors in parentheses
* $p < .05$, ** $p < .01$

Table 5.6. Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses

Intermediate Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
In-Class Presentation N=305											
Lecture usually or always	-0.152*	-0.106	0.065	0.038	-0.092	-0.012	-0.078	-0.007*	0.007	-0.019	0.000
	(0.062)	(0.115)	(0.089)	(0.064)	(0.074)	(0.068)	(0.075)	(0.004)	(0.011)	(0.068)	(0.002)
Lecture usually or always: 2020 Scale	-0.128*	-0.225	-0.031	-0.078	0.020	-0.047	-0.110	-0.008	-0.004	-0.055	0.002
	(0.064)	(0.123)	(0.119)	(0.082)	(0.076)	(0.082)	(0.086)	(0.004)	(0.013)	(0.082)	(0.002)
Discussion N=305											
Student-to-student Discussion	0.137**	0.015	0.007	-0.068	-0.052	0.121	-0.106	0.000	-0.008	0.022	-0.004*
Activities	*N=284*										
Cooperative Learning	0.241**	0.002	0.054	-0.045	-0.003	0.171	-0.062	-0.001	0.011	0.111	-0.001
	(0.064)	(0.133)	(0.134)	(0.094)	(0.088)	(0.089)	(0.093)	(0.005)	(0.015)	(0.083)	(0.003)
References to Literature, Drama, or Music	-0.125*	0.071	0.107	0.010	-0.244**	-0.036	0.026	-0.001	0.014	0.021	-0.003
	(0.063)	(0.136)	(0.132)	(0.093)	(0.071)	(0.090)	(0.096)	(0.004)	(0.014)	(0.075)	(0.003)
References to Sports	-0.226**	0.079	0.013	-0.018	-0.233**	-0.056	0.111	0.001	-0.018	-0.049	-0.006*
	(0.063)	(0.139)	(0.137)	(0.092)	(0.076)	(0.091)	(0.090)	(0.005)	(0.015)	(0.081)	(0.003)
Materials N=305											
Press Readings	0.133*	-0.198	0.189	0.148	-0.015	0.111	-0.064	0.003	0.028*	0.016	-0.004
	(0.066)	(0.113)	(0.121)	(0.088)	(0.083)	(0.086)	(0.087)	(0.004)	(0.013)	(0.077)	(0.002)
Grading N=307											
Exams with Multiple-Choice Questions	0.130*	-0.209	-0.129	-0.091	0.185*	-0.017	0.116	-0.001	-0.015	0.167	0.002
	(0.063)	(0.110)	(0.121)	(0.085)	(0.078)	(0.085)	(0.094)	(0.004)	(0.014)	(0.097)	(0.002)

Table 5.6. Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses (continued)

Group work worth more than 10% of semester grade	0.135*	0.054	0.070	-0.009	0.123	0.119	0.068	0.000	0.008	-0.135*	-0.001
	(0.058)	(0.096)	(0.102)	(0.062)	(0.073)	(0.071)	(0.072)	(0.003)	(0.009)	(0.065)	(0.002)
Math Importance	*N=307*										
Numerical Calculations Extremely Important	0.162**	0.064	-0.117	-0.104	0.025	-0.066	-0.055	-0.002	-0.007	0.024	-0.001
	(0.062)	(0.127)	(0.123)	(0.085)	(0.081)	(0.085)	(0.090)	(0.004)	(0.013)	(0.076)	(0.002)
Graphs Extremely Important	0.148**	0.173	-0.070	0.010	-0.014	-0.016	-0.036	0.004	-0.011	0.013	-0.005*
	(0.054)	(0.089)	(0.126)	(0.086)	(0.080)	(0.083)	(0.092)	(0.004)	(0.012)	(0.074)	(0.002)
Numerical Calculations Fairly or Extremely Important	0.096*	0.053	-0.062	-0.096	0.016	-0.163*	-0.045	-0.001	-0.013	0.044	-0.004
	(0.046)	(0.095)	(0.104)	(0.076)	(0.064)	(0.082)	(0.077)	(0.004)	(0.010)	(0.057)	(0.002)

Statistics, Econometrics, and Math Economics

Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
In-Class Presentation N=224											
Lecture usually or always: 2020 Scale	-0.158*	0.023	-0.090	-0.029	0.113	-0.041	0.090	-0.002	-0.013	-0.114	0.001
	(0.073)	(0.170)	(0.132)	(0.102)	(0.089)	(0.094)	(0.103)	(0.005)	(0.014)	(0.126)	(0.006)
Discussion N=224											
Student-to-teacher Discussion	0.140*	-0.063	0.122	0.071	0.048	0.115	0.086	-0.013	0.014	0.074	-0.009
	(0.066)	(0.156)	(0.088)	(0.086)	(0.080)	(0.078)	(0.075)	(0.009)	(0.015)	(0.119)	(0.006)
Activities N=217											
Cooperative Learning	0.223**	0.107	0.070	0.067	-0.066	0.125	-0.074	-0.008	0.009	-0.005	0.005
	(0.072)	(0.169)	(0.138)	(0.103)	(0.091)	(0.094)	(0.111)	(0.006)	(0.014)	(0.140)	(0.007)
Computer Lab Assignments	0.132*	-0.160	-0.256	-0.158	-0.110	0.148*	0.046	-0.002	0.004	0.169	0.006
	(0.054)	(0.174)	(0.136)	(0.101)	(0.087)	(0.069)	(0.084)	(0.004)	(0.012)	(0.112)	(0.005)

Table 5.6. Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses (continued)

References to Diversity and Inclusion Issues	0.161*	-0.044	0.003	0.019	-0.099	0.181	0.096	0.003	0.006	-0.026	0.004
	(0.076)	(0.136)	(0.125)	(0.092)	(0.066)	(0.093)	(0.101)	(0.004)	(0.013)	(0.117)	(0.005)
References to Gender Issues	0.215**	-0.238	-0.207	-0.000	-0.007	0.196*	0.003	0.002	-0.026	-0.111	0.010
	(0.076)	(0.126)	(0.126)	(0.102)	(0.088)	(0.092)	(0.105)	(0.005)	(0.015)	(0.130)	(0.006)
Materials N=221											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
Press Readings	0.206**	0.164	0.007	-0.021	-0.182**	0.188*	0.135	0.004	0.013	0.035	0.017**
	(0.078)	(0.166)	(0.128)	(0.093)	(0.063)	(0.094)	(0.105)	(0.005)	(0.013)	(0.122)	(0.006)
Scholarly Readings	0.184*	-0.252	-0.083	-0.100	-0.123	0.367**	0.028	0.007	0.003	-0.160	-0.000
	(0.079)	(0.147)	(0.143)	(0.100)	(0.085)	(0.087)	(0.107)	(0.005)	(0.015)	(0.148)	(0.006)
Grading N=224											
Term Papers	0.193**	-0.225	-0.021	-0.049	-0.001	0.024	-0.095	0.006	0.012	0.082	-0.011
	(0.075)	(0.155)	(0.140)	(0.101)	(0.087)	(0.095)	(0.100)	(0.005)	(0.014)	(0.134)	(0.006)
Other Upper Division Courses											
Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
In-Class Presentation N=579											
Lecture usually or always	-0.208**	0.022	0.051	0.012	0.044	-0.198**	0.034	-0.002	-0.001	-0.036	0.006**
	(0.046)	(0.092)	(0.084)	(0.060)	(0.057)	(0.063)	(0.062)	(0.003)	(0.008)	(0.063)	(0.002)
Lecture usually or always: 2020 Scale	-0.216**	0.028	-0.037	-0.011	0.086	-0.141*	0.031	0.003	-0.010	-0.057	0.007**
	(0.043)	(0.102)	(0.094)	(0.066)	(0.065)	(0.063)	(0.068)	(0.003)	(0.009)	(0.067)	(0.002)
Movie or video clip use	0.146**	0.059	0.166	0.028	-0.008	-0.020	0.111	-0.004	0.004	0.142*	0.003
	(0.045)	(0.098)	(0.088)	(0.065)	(0.063)	(0.064)	(0.070)	(0.003)	(0.009)	(0.071)	(0.002)

Table 5.6. Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses (continued)

Guest lectures	0.140**	-0.145	-0.104	-0.054	-0.058	-0.047	-0.071	0.003	-0.001	-0.112	0.002
	(0.043)	(0.094)	(0.089)	(0.064)	(0.060)	(0.063)	(0.067)	(0.003)	(0.009)	(0.070)	(0.002)
Discussion N=579											
Student-to-student Discussion	0.088**	0.002	-0.055	-0.119*	0.014	0.048	-0.011	0.002	-0.005	0.034	0.001
	(0.026)	(0.062)	(0.064)	(0.055)	(0.038)	(0.036)	(0.046)	(0.002)	(0.005)	(0.038)	(0.002)
Activities N=545											
Cooperative Learning	0.277**	0.116	0.040	0.107	-0.066	0.166*	-0.071	0.002	-0.002	0.068	0.007*
	(0.044)	(0.097)	(0.097)	(0.069)	(0.067)	(0.066)	(0.075)	(0.004)	(0.009)	(0.074)	(0.003)
Self-assessments	0.089**	0.123	0.073	0.019	-0.038	0.067	0.004	-0.000	0.006	0.017	0.001
	(0.034)	(0.069)	(0.058)	(0.034)	(0.023)	(0.040)	(0.033)	(0.001)	(0.004)	(0.033)	(0.001)
Lessons/Activities on Gender Issues	0.098*	-0.082	0.070	-0.002	-0.074*	-0.026	-0.022	0.001	0.003	-0.018	-0.000
	(0.041)	(0.047)	(0.076)	(0.044)	(0.034)	(0.039)	(0.044)	(0.002)	(0.006)	(0.040)	(0.002)
References to Diversity and Inclusion Issues	0.153**	-0.037	0.004	-0.015	-0.186**	0.104	0.055	0.005	0.006	-0.095	0.004
	(0.046)	(0.093)	(0.094)	(0.065)	(0.053)	(0.063)	(0.069)	(0.003)	(0.009)	(0.065)	(0.002)
References to Gender Issues	0.121**	0.019	-0.040	-0.039	-0.157**	0.057	0.061	0.001	-0.003	-0.034	-0.002
	(0.046)	(0.095)	(0.094)	(0.066)	(0.058)	(0.064)	(0.068)	(0.003)	(0.009)	(0.067)	(0.003)
References to Sports	-0.191**	0.017	-0.138	-0.092	-0.189**	0.048	0.207**	-0.002	-0.011	0.123	0.002
	(0.046)	(0.099)	(0.092)	(0.066)	(0.062)	(0.066)	(0.065)	(0.003)	(0.009)	(0.070)	(0.002)
Materials N=572											
Press Readings	0.114**	0.034	-0.013	-0.004	-0.112	0.127*	0.023	0.001	0.007	0.076	-0.001
	(0.044)	(0.093)	(0.090)	(0.065)	(0.060)	(0.059)	(0.067)	(0.003)	(0.009)	(0.068)	(0.002)
Literature Search of Research N=571											
Library Holdings	0.097*	-0.098	-0.104	0.006	-0.048	0.069	0.008	0.006	0.005	-0.047	-0.001
	(0.045)	(0.095)	(0.092)	(0.065)	(0.062)	(0.061)	(0.067)	(0.003)	(0.009)	(0.071)	(0.002)

Table 5.6. Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses (continued)

Internet Searches	0.106**	-0.033	0.020	0.057	0.021	0.058	-0.033	0.002	0.010	-0.028	0.001
	(0.039)	(0.092)	(0.083)	(0.059)	(0.058)	(0.057)	(0.068)	(0.003)	(0.009)	(0.068)	(0.003)
EconLit	0.197**	0.025	0.046	0.048	-0.059	0.186**	0.095	0.002	0.034**	0.086	0.000
	(0.047)	(0.096)	(0.092)	(0.065)	(0.057)	(0.062)	(0.069)	(0.003)	(0.008)	(0.068)	(0.002)
Grading N=579											
Shorter Papers	0.109*	0.083	-0.017	-0.067	-0.130*	0.160**	-0.002	0.006*	0.001	-0.001	-0.004
	(0.046)	(0.092)	(0.086)	(0.060)	(0.052)	(0.062)	(0.063)	(0.003)	(0.008)	(0.064)	(0.002)
Oral Presentations	0.129**	0.197*	0.070	0.015	-0.027	0.089	-0.125*	0.000	0.006	-0.058	-0.009**
	(0.046)	(0.090)	(0.090)	(0.063)	(0.061)	(0.063)	(0.063)	(0.003)	(0.009)	(0.068)	(0.002)
Class Participation	0.127**	-0.056	-0.028	-0.017	0.002	0.124*	0.104	-0.001	-0.008	-0.061	-0.003
	(0.046)	(0.090)	(0.091)	(0.064)	(0.062)	(0.063)	(0.068)	(0.003)	(0.009)	(0.072)	(0.003)
Group Work	0.241**	0.053	0.098	0.061	0.021	0.11	-0.045	0.003	-0.003	0.036	0.005
	(0.044)	(0.097)	(0.091)	(0.066)	(0.063)	(0.066)	(0.068)	(0.003)	(0.009)	(0.068)	(0.003)
Multiple-choice Exams worth less than 50% of semester grade	0.043*	0.014	0.002	-0.020	0.007	0.015	-0.045	0.000	-0.005	-0.017	-0.004**
	(0.020)	(0.035)	(0.042)	(0.030)	(0.026)	(0.030)	(0.038)	(0.001)	(0.004)	(0.036)	(0.002)
Group work worth more than 10% of semester grade	0.236**	0.081	0.115	0.060	0.013	0.078	-0.046	0.001	0.003	0.047	0.003
	(0.045)	(0.095)	(0.089)	(0.063)	(0.060)	(0.064)	(0.064)	(0.003)	(0.008)	(0.065)	(0.003)

Standard errors in parentheses
[*] $p < .05$, [**] $p < .01$

estimates were not significant for every form of writing assignment, female faculty were generally more likely to include writing assignments of some kind in the determination of course grades.

The new variables for multiple choice weight, group work weight, and math importance also returned significant marginal effects. Female faculty were less likely to weight multiple choice exams by 50% or more in both principles (14 percentage points) and other upper division courses (4 percentage points). At all levels except statistics and econometrics they are between 12 and 24 points more likely to weight group work as 10% or more of the course grade. Among the set of math importance variables, in principles and intermediate courses female instructors are 10 percentage points more likely to rate skill with graphs as fairly or extremely important, and between 13 and 15 percentage points more likely to rate graphs extremely important. They are 10 percentage points more likely to rate calculus extremely important in intermediate courses, but 8 percentage points less likely to rate it as extremely important for statistics and econometrics courses. They are 7 percentage points less likely to rate calculus as fairly or extremely important in other upper division courses.

There are some miscellaneous results of note. Courses in statistics, econometrics, and math economics stand out as the type of classes with the least variety of methods for both instruction and assessment. One possible explanation is that the relatively technical nature of the instruction in these types of courses results in a narrower range of methods. Next, class size rarely had an impact on the selection of either instruction or assessment method choices, while Baccalaureate did. Finally, faculty who speak English as a second language are more likely to employ greater variety in their choice of activities than their peers for whom English is their first language.

5.5 Discussion

On balance, the answer to the question "Do women teach and assess economics differently than men?" is an unequivocal "Yes." Research on the effectiveness of teaching strategies beyond chalk and talk suggests female faculty are also therefore teaching more effectively. Overall, they are more likely to employ teaching and assessment methods that involve interaction, verbal communication, or oral communication. They are also less likely to heavily weight multiple choice exams. In other words, they are more likely than their male counterparts to diverge from the standard economic practice of chalk and talk.

Though the difference is clear between the methodological choices of female and male faculty, the magnitude of that difference is less so. Significant marginal effect estimates across variables are as small as approximately 4 percentage points and as large as approximately 28 percentage points. Also, marginal effect estimates in this analysis arise from binary dependent variables. Employing a multinomial probit model could reveal the scope of the difference with greater accuracy, but that is beyond the scope of this analysis and is a topic for future research.

What explains the difference between the methods of female and male instructors? One possibility is that the differences are simply a function of the oversampling of Doctoral institutions in the survey responses. The share of women faculty at doctorate-granting institutions currently is approximately 26%, below the 38% at all other types of institutions (Chevalier, 2022). As tempting as it would be to see this disparity as the explanation for the difference in instruction and assessment methods among women and men in this data, that breakdown does not match response rates for this iteration of the survey.

Another possibility is that women simply have a comparative advantage in designing and implementing these strategies, or that women use teaching methodologies that favor skills in which female students have a comparative advantage (Harter, Becker, & Watts, 1999). However, even that idea is seen by some to be an example of the implicit bias that female faculty face in the academy (Laursen & Austin, 2020). Kessler et al. (2014) find that on average men prefer working with “things” (including data), while women tend to prefer working with people, so another potential explanation is that women prefer strategies that are more relational. Finally, it is also possible that women feel like they simply have to be better teachers than their male counterparts. The perception has long existed that university environments are “nonsupportive” of women (Tidball, 1976). That perception persists in economics, and for good reason. Though older work did not find evidence of gender bias in course evaluations (Anderson & Siegfried, 1997) more recent work has (Boring, 2017; Buser, Batz-Barbarich, & Hayter, 2022; Keng, 2020; Moore, Song, & Whitney, 2021). Research also finds that women face an uphill climb for respect from their peers. Dupas et al. (2021) find that women receive more hostility when presenting work at economics conferences. In their wider analysis they conclude, “[O]ne characterization of the emerging literature on gender biases within the economics profession is that every rock we look under reveals yet another way in which existing institutions are biased against women” (p. 26). Antecol, Bedard, and Sterns (2018) find that gender-neutral tenure clock stopping, while well-intentioned, actually reduces tenure rates among women while increasing them for men. Sarsons (2017) has shown that women have a lower probability of earning tenure if they coauthor with men relative to coauthoring with women or publishing solo. Finally, women are less likely to specialize in “prestige” fields such as labor/health, macro/finance, industrial organization, public economics, and development/growth/international fields, and are more likely to specialize in agricultural/resource/environmental economics (Sierminska & Oaxaca, 2021). In other words, women may engage in more varied teaching methods to compensate for these headwinds. If that is the case, there is room for departments to examine whether there may be any implicit or unintentional, or even explicit and intentional, double standard being communicated to their female faculty.

There are limitations to this study. Besides the limitation created by an opportunistic sample, there is also the issue of the binary nature of the variables. Since the probit regression counted any use of a particular teaching or assessment method as a 1, it is possible that the effects of some instructor determinants are being either over or underestimated. An ordered probit model could address this limitation. For example, it is possible that the overall difference between the probability that a male or female instructor makes use of cooperative learning strategies may be in the single digits, while the probability they use them infrequently versus frequently could be much higher.

The findings in this study invite future research on some of the other predictors in the model. For example, one would have expected class size and Carnegie Classification to be highly correlated. However, the collinearity check did not reveal cause for concern. Furthermore, marginal effect estimates for Baccalaureate were significant more often than class size was for presentation and grading variables. One possible explanation here is that though Doctoral institutions use larger class sizes, choice of method is less a function of the class size and more of the degree to which an institution values teaching relative to research. This is an intuition shared by Schaur et al. (2012) and chapter 6 of this dissertation, which analyzes the way economics instruction and assessment differs across Carnegie classifications. Next, the frequency at which ESL was a significant predictor of choice of activities shows that the experiences of instructors for whom English is not their first language are worth exploring more fully.

Whatever the explanation for the difference in the methods used by male and female instructors, departments could benefit from measures to improve the variety of their instruction and assessment. These benefits range from improved student engagement, learning gains, and a better perception of the discipline among students (Allgood et al., 2004; Bodary & Gross, 2018; Carter & Emerson, 2012; Kuh & Hu, 2001; Sierra, 2020; among others), to the reduction of achievement gaps (Haak et al., 2011; Lage, Platt, & Treglia, 2000). On the assessment side, research finds learning and engagement benefits of cases (Ray, 2018), self-assessment tools like the one-minute paper (Chizmar & Ostrosky, 1998), and writing opportunities in an economics class (Frank, 2006). This is not to say that academic economists should eliminate multiple choice questions. After all, beyond benefits like the ease of grading, they can test greater breadth (Rebeck & Asarta, 2012), aid in recall (Chan & Kennedy, 2002), and could even compensate for gender differences (Siegfried & Wuttke, 2019). On a purely self-interested level, departments and individual instructors should remember that better teaching improves public and student perceptions of our discipline. Allgood et al. (2004)—echoing the work by Boex (2000), Bosshardt and Watts (2001) and

Reverter et al. (2020)—find that years later students who either took or majored in economics reported not having been all that impressed with how it was taught. Evans, Grimes, and Becker (2012) find that good teachers and good teaching draw people to the field. Increased enrollments mean more funding and more people being introduced to the economic way of thinking. This is not to suggest that faculty should eliminate multiple choice and chalk and talk. Rather, these methods should be supplemented with others of greater variety (Hiebert et al., 2005; Rebeck & Asarta, 2012; Siegfried & Wuttke, 2019). Departments would do well to encourage such variety and reward those already working in that direction. They would also better serve themselves, their faculty, and their students by evaluating the degree to which their promotion and tenure structures, incentives, and departmental culture create divergent expectations and rewards for their male and female faculty.

Chapter 6

DETERMINANTS OF ACTUAL AND PREFERRED TIME ALLOCATION OF ACADEMIC ECONOMISTS

6.1 Introduction

Between teaching, service, and other departmental responsibilities, academic economists face very different time allocation issues than their non-academic counterparts. Analysis of academic economists' time allocation and the incentive and reward structures that shape those choices began 50 years ago with Siegfried and White (1973). Becker (1979) followed with a theoretical model of time allocation. His analysis explored the expected effects on time allocation of adjustments to the weight a department may place on an instructor's teaching and research. Since then, other work has followed to develop empirical insights into the factors underlying time allocation choices not just by economists, but in the academy at large. Though some research has been done on the allocation itself, much less work examines whether there is a difference between actual and preferred time allocation. Using data from the 2020 iteration of a national survey of academic economists, this study employs linear regression analysis to explore the factors that influence academic economists' choices, their preferences, and any meaningful differences between the two.

6.2 Literature Review

Time allocation literature focused on the academy is limited and primarily explores the dichotomy of teaching versus research. Much of this research finds a bias against teaching and toward research (Stupnisky, Pekrun, & Lichtenfeld, 2016; Walstad & Allgood, 2005). Wilkesmann and Schmid (2014) go so far as to report that "…[T]eaching is said to be the professoriate's neglected stepchild" (p. 6). Forest's (2002) exploration of the teaching vs. research dichotomy was based on a simple question: "Regarding your own preferences, do your interests lie primarily in teaching or in research?" First, he finds that more female than male faculty prefer teaching. He also reports that though age correlates positively with an orientation toward teaching, time in the profession does not. Next, in the United States, time at one's institution is a significant predictor of teaching preference, as is time between leaving school and returning to teach. Having a Ph.D. is a negative predictor of a preference for teaching. Finally, faculty employed at liberal arts institutions are significantly more likely to indicate a preference for teaching, and those employed at R1's or R2's to indicate a preference for research. In addition to Forest's work, the connection between research productivity/time allocation and gender has been confirmed by several studies since Forest (Bentley & Kyvik, 2013; Kessler, Spector, & Gavin, 2014; Link, Swann, & Bozeman, 2008; Taylor, Fender, & Burke, 2006; Webber, 2018; Webber & Rogers, 2018), as has the connection between research productivity/time allocation and type of institution (Bentley & Kyvik, 2013; Kessler, Spector, & Gavin, 2014; Stupnisky, BrckaLorenz, Yuhas, & Guay, 2018; Taylor, Fender, & Burke, 2006).

If there is a limited amount of research on time allocation in academia, there is even less on the time allocation of academic economists. Walstad and Allgood (2005) use National Study of Postsecondary Faculty survey data to explore determinants of time allocation across disciplines. They find that female faculty allocate more time to teaching and less time to research than males; that associate professors allocate more time to teaching and less time to research than full and assistant professors; and that faculty at institutions perceived to reward teaching allocate more time to teaching. Their comparison across disciplines reveals a small difference between economists and faculty in other fields, with economists researching more and teaching less. Allgood and Walstad (2013) extend their work with the same data, but compare the actual and preferred time allocation of economists relative to other disciplines. They find that economists allocate slightly more time to teaching than their peers elsewhere in the academy. However, they find that academic economists *prefer* a lower proportion of teaching time than any discipline besides biological sciences. Furthermore, economists show the greatest gap between preferred and actual teaching time, as well as the lowest regard for teaching (based on a variety of questions).

Harter, Becker, and Watts (2011) complement Walstad and Allgood's (2005) and Allgood and Walstad's (2013) work with an analysis of the 1995, 2000, and 2005 iterations of a national quinquennial survey on teaching and assessment methods. They find that across all Carnegie Classifications, females allocate more time to research and males to teaching. They also find effects of rank, but those effects depend on the type of institution. Finally, they find the expected signs on the coefficients for weight of teaching and weight of research in promotion and tenure decisions. However, the size of the impact also varies across Carnegie Classifications.

6.3 Relevance of the Current Study

The current study confirms past research on the time allocation of economists, as well as time allocation research built on the quinquennial survey, but will expand on both in meaningful ways. First, this study extends the work of Walstad and Allgood (2005) and Allgood and Walstad (2013) by examining all Carnegie Classifications rather than simply Research/Doctoral. Next, while Allgood and Walstad made use of the NSOPF survey, this analysis examines the most recent iteration of the quinquennial survey. Furthermore, this study will extend the work of Harter et al. (2011) by updating their findings using the most recent quinquennial survey data. Finally, the earlier iterations of the quinquennial survey did not include any questions about preferred time allocation. The most recent iteration added questions on preference, and this survey takes advantage of that change to look at preferred as well as actual time allocations.

As Link, Swann, and Bozeman (2008) have found, examination of the teaching vs. research and actual vs. preferred dichotomies of academic economists, as well as the determinants of time allocation more generally, has the potential to improve the quality of undergraduate economics instruction. They point out, “The appropriate policy response depends on the reasons for different time allocations” (p. 374). Insights provided by this study can provide a greater understanding for those reasons and will allow departments with an interest in increasing the methodological variety employed by their faculty with the ability to target the incentives and motivations that can shift time allocation in meaningful ways.

6.4 Data Description

As with the other essay chapters in this dissertation, the data for this analysis comes from the administration of the Sixth National Quinquennial Survey on Teaching and Assessment Methods in Undergraduate Economics. Also as described elsewhere (see section 4.4), minor changes were made to the survey for the 2020 iteration related to the scale of methods questions, technological change, and some demographic questions. The change most relevant for this study comes from the addition of the question regarding desired time allocation. All previous quinquennial surveys and the current version included the question, “What percentage of your work time is devoted to…”, followed by the categories teaching, research, administration, consulting, service, and other. For 2020, the survey added the question, “What would the desired allocation of work time be in your ideal position?” followed by the same categories.

With the exception of the Carnegie Classifications themselves, all independent variables come from questions on the survey. The independent variables are both continuous and categorical. In keeping with past work, teaching load is an institutional variable, not an individual one. The survey asks for tenure track teaching load and non-tenure track teaching load rather than a combined average. Rather than incorporate both variables in the model for this analysis, for the sake of simplicity only tenure track teaching load is included. In keeping with Harter et al. (2011), only principles class size is included in the model rather than class sizes for all course levels. Adding others as well would have introduced issues of collinearity. The dependent variables on actual time allocation are the same as those analyzed by Harter et al. and come directly from survey responses. In addition to the actual time allocation variables, this study will analyze the determinants of preferred time allocation, also drawn directly from survey responses.

Definitions for departmental incentives, faculty members’ time allocation, and faculty members’ desired time allocation are reported in Table 6.1. Full tables breaking down incentive and time allocation variables by rank, Carnegie Classification, gender, and rank by gender can be found in Appendix D. Mean

Table 6.1. Variable Definitions and Median and Mean Values

Variable	N	Median	Mean	SD
Proteach: Weight in percentage of teaching on decisions of promotion and tenure	864	40.00	33.36	(23.90)
Prorsch: Weight in percentage of research on decisions of promotion and tenure	865	40.00	40.41	(28.32)
Prosrv: Weight in percentage of service on decisions of promotion and tenure	866	10.00	11.56	(9.96)
Annteach: Weight in percentage of teaching on decisions of annual raises	858	20.00	23.21	(24.86)
Annrsch: Weight in percentage of research on decisions of annual raises	862	30.00	32.36	(39.90)
Annsrv: Weight in percentage of service on decisions of annual raises	863	5.00	9.29	(12.03)
Wrkteach: Time allocated to teaching	862	50.00	50.25	(24.42)
Wrkrsch: Time allocated to research	861	20.00	24.24	(20.31)
Wrksrv: Time allocated to service	861	10.00	10.85	(10.16)
Dteach: Desired time allocated to teaching	861	45.00	44.46	(25.44)
Drsch: Desired time allocated to research	860	35.00	34.59	(25.76)
Dsrv: Desired time allocated to service	862	7.75	7.71	(8.21)

responses, median responses, and standard deviations are provided. Harter et al. (2011) only include mean values, but for some variables the difference in median and mean will have some bearing on the question of preferences and medians are therefore included as well. Percentages do not sum to 100 because some faculty will also allocate time to consulting, administration, or other activities. Because those activities lie beyond the scope of this analysis, they are not included with the variables of interest.

Descriptive statistics show that across all Carnegie Classifications the time faculty teach and research does not align with the incentive and reward structure they face. The data in Harter et al. (2011) yielded similar results. They speculate that across all Carnegie Classifications the mismatch can be explained by class sizes, teaching loads, uncertain returns to time spent on research, and a preference for time spent teaching. There are several other potential explanations. First, it is possible that the returns to an hour of research are actually *higher* relative to the returns to an hour of teaching in terms of reaching required benchmarks for each activity. Also, time spent on teaching includes the required time of actually being in class which, depending on one's course load, could involve anywhere between 3 and 12 non-discretionary hours a week. Another factor at play could be the fact that some respondents are non-tenure-track faculty who are not eligible for promotion and therefore answered the promotion and tenure weight survey questions with 0's. The proportion of faculty who responded in that manner was highest among lecturers, instructors, and adjuncts. As the full incentive and time allocation tables in Appendix D show, breaking down the incentive and allocation variables by rank helps illustrate the effect of responses of 0 on promotion and tenure weights. The primary responsibilities of the rank of lecturers, instructors, and adjuncts is teaching, so their time allocated to teaching is higher than for all other ranks. Yet the mean weight of teaching in considerations of both promotion and raises for the rank of lecturers, instructors, and adjuncts is lower than for all other ranks. In other words, responses of 0% on the promotion and tenure weight questions are concentrated on the rank most responsible for teaching, which magnifies the perceived incongruity between incentives and time allocation.

Comparing incentive and allocation variables across Carnegie Classifications reveals some immediate insights as well (see Tables 6.9.1, 6.9.2, and 6.9.3 in Appendix D). Associate's institutions had too few observations and therefore cannot be included in this comparison. The disequilibrium between the incentive structure and time allocation is most pronounced at Doctoral institutions. The closest match occurs at Baccalaureate institutions. The issue noted above of lecturers, instructors, and adjuncts not being eligible for promotion is likely influencing this disequilibrium. Of the 109 lecturers, instructors, and adjuncts in the sample, 73 come from Doctoral institutions.

Breaking down the incentive and time allocation variables by gender also reveals some differences worth noting (see Table D.5 in Appendix D). First, female and male faculty experience almost identical weight placed on their teaching for promotion and tenure decisions. Male faculty however experience an almost 8 percentage point greater weight placed on their research. One possible explanation for this could be that there are relatively fewer males in teaching-centered positions. Breaking down male and female respondents by their rank does not make it clear if this is the case. With the exception of the rank of full professor (74% male), there is not a significant relative difference in the proportions of female and male faculty in the ranks of lecturer, instructor, or adjunct, assistant professor, and associate professor (56%, 60%, and 56% male respectively). A concentration of female faculty in teaching-centered positions could still serve as an explanation if female faculty in the data were localized in a particular type of institution, but that is not the case. Another potential explanation could be that male faculty perceive their research as being weighted more heavily, that female faculty perceive their teaching being weighted less heavily, or a combination of the two.

Separating the respondents by both gender and Carnegie Classification shows that within each type of institution female faculty allocate a greater proportion of their time to teaching and lower proportion of their time to research, relative to their male counterparts. The differences are often slight.

Focusing on incentives themselves, the 2020 data also shows that the downward trend of the weight of teaching in promotion and tenure at Doctoral institutions observed in the 1995, 2000, and 2005 quinquennial surveys has continued. The weight placed on teaching by Baccalaureate schools rose from 1995 to 2005, but has fallen since. Master's institutions have remained fairly stable. The weight placed on both teaching and research at Doctoral institutions has declined since 2005, from 30.6% to 22.7% and 57.6 to 50.7% respectively.

For desired time allocation, the disparity between allocation and incentives continues, though to a lesser degree. Desired teaching time and research time both move toward the incentive structure, while desired time allocated to service moves away from the incentive structure. Breaking down the sample by Carnegie Classification reveals differences among the types of institution. The preferred time allocation for research and teaching at Baccalaureate institutions aligns almost perfectly with the promotion and tenure reward structure faculty face there. The preferred time allocated to research for faculty at Master's institutions comes close to matching the promotion and tenure incentive structure. Faculty at Doctoral institutions indicate a preferred change to their teaching and research of at least 10 percentage points. Even with that, both allocations are still at least 10 percentage points away from aligning with the promotion and tenure incentive structure. The greatest distance between preferred teaching and research time occurs at Baccalaureate institutions, where the mean preferred teaching time is 21 percentage points higher. The preferred teaching and research time at Doctoral institutions is almost even. The NSOPF data explored in Walstad and Allgood (2005) showed a similar breakdown (40% to teaching and 43% to research). At each type of institution and at each rank, female faculty indicate a desire to teach less than they do currently and to research more. They also indicate a preference for teaching over research relative to their male colleagues.

6.5 Determinants of Time Allocations

Harter et al.'s (2011) analysis of time allocation makes use of data from the 1995, 2000, and 2005 quinquennial surveys. This study, working with the most recent quinquennial survey data, replicates many of their methods. Beginning with actual time allocation, determinants are explored using linear regressions models. The dependent variable for these models is either the time allocated to teaching or the time allocated to research. Independent variables are individual and institutional variables drawn from individuals' survey responses. Descriptive statistics for remaining independent variables can be found in Table 6.2. Most respondents are male, teach at a doctoral institution, and speak English as a first language. The mean for years of experience is a little over 18 years. The rank most represented in the sample is full professor.

Table 6.2. Additional Variable Definitions and Median and Mean Values

Variable	N	Median	Mean	SD
Associate's Institutions	1138	0.00	0.02	(0.12)
Baccalaureate Institutions	1138	0.00	0.22	(0.42)
Master's Institutions	1138	0.00	0.22	(0.41)
Doctoral Institutions	1138	1.00	0.54	(0.50)
Female	871	0.00	0.36	(0.48)
Lecturer/Instructor/Adjunct	856	0.00	0.13	(0.34)
Assistant Professor	856	0.00	0.24	(0.43)
Associate Professor	856	0.00	0.21	(0.41)
Full Professor	856	0.00	0.33	(0.47)
ESL	874	0.00	0.18	(0.38)
Class size: Principles	610	40.00	93.73	(139.63)
Tenure-track teaching load	801	4.50	4.82	(1.74)
AEA Member	839	1.00	0.65	(0.48)

6.5.2 Time Allocation and Carnegie Classification

Correlations between Carnegie Classifications and institutional characteristics of class size in principles courses, teaching load for tenure track faculty, and the weight of teaching on promotion and tenure decisions and raises were not as high in the data from the 2020 survey[5], but were still high enough to merit maintaining Harter et al.'s (2011) method of first running a model for the whole sample with Carnegie Classification as the only independent variable, and then separating the sample by type

[5] The only correlation above .5 was for Doctoral institutions and tenure-track teaching load.

of institution. The results of these regressions can be found in Table 6.3. The omitted category is Doctoral institutions.

Table 6.3. OLS regression for Carnegie Classifications: Dependent variable = percentage of time spent on teaching

Carnegie Classification	Percent of time spent on teaching	Percent of time spent on research
Associate's Institutions	23.450^{**}	-24.556^{**}
	(7.795)	(1.774)
Baccalaureate Institutions	12.929^{**}	-7.751^{**}
	(1.804)	(1.514)
Master's Institutions	9.066^{**}	-9.049^{**}
	(2.026)	(1.585)
Constant	45.050^{**}	28.306^{**}
	(1.176)	(1.042)
Adjusted R^2	0.060	0.058
Observations	862	861

Standard errors in parentheses
* $p < .05$, ** $p < .01$

As expected, across all ranks faculty at all Carnegie Classifications allocate more time to teaching and less to research relative to faculty at Doctoral institutions. Also as expected, adjusted R^2 for each regression is low, confirming other factors are at work.

6.5.3 Demographic and Institutional Determinants of Time Allocation

In subsequent regressions, Carnegie Classifications were replaced with demographic predictors of gender, rank, whether the respondent speaks English as a second language, years of experience, membership in the American Economic Association, institutional predictors of the weight of teaching or research in promotion and tenure decisions, principles class size, and tenure-track teaching load. Because of collinearity issues with the weightings of teaching and research for promotion and tenure or annual raise decisions, each model contains just one of the weighting variables. Table 6.4 displays results for the regression for time allocated to teaching.

Table 6.4. OLS Regression for individual and school variables: Dependent variable = percentage of time spent on teaching

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	2.353	3.381	4.438	0.805
	(1.862)	(3.183)	(3.483)	(2.869)
Lecturer/Instructor/Adjunct	27.417**	8.792	46.676**	37.286**
	(5.049)	(9.929)	(11.687)	(7.342)
Assistant Professor	11.744*	10.911	22.591*	17.645*
	(4.903)	(8.203)	(10.617)	(7.542)
Associate Professor	5.273	1.460	13.644	13.343
	(4.579)	(7.255)	(9.787)	(7.298)
ESL	-1.381	4.395	0.071	-5.200
	(2.485)	(4.454)	(4.517)	(3.717)
Proteach	0.044	0.130	0.184*	-0.237**
	(0.046)	(0.090)	(0.091)	(0.078)
Experience	0.124	0.476*	0.108	0.107
	(0.106)	(0.222)	(0.196)	(0.150)
Class size: Principles	-0.013	-0.096	-0.039	-0.002
	(0.008)	(0.165)	(0.055)	(0.009)
Tenure-track teaching load	1.145	0.930	-1.269	4.149**
	(0.584)	(1.062)	(0.966)	(1.194)
AEA Member	-2.553	3.044	-5.968	-5.566
	(1.851)	(3.260)	(3.364)	(2.892)
Constant	39.518**	28.119**	52.651**	32.312**
	(5.021)	(10.575)	(10.202)	(7.865)
Adjusted R^2	0.140	0.043	0.171	0.253
Observations	503	130	135	230

Standard errors in parentheses
* $p < .05$, ** $p < .01$

The first column of each table displays the results for the full sample. Subsequent columns display the results for each Carnegie Classification, with the exception of

Associate's schools. Because this study only has data from one iteration of the quinquennial survey, there were not enough observations from Associate's schools for meaningful analysis. Those institutions are therefore included in the overall analysis, but do not receive individual treatment.

All ranks allocate more of their time to teaching than full professors. This holds true for the full sample, and for most Carnegie Classifications. At Doctoral institutions in particular, lecturers, instructors and adjuncts, assistant professors, and associate professors spend more of their time on teaching, relative to full professors. The weight of teaching in promotion and tenure has gone from being significant at all types of institutions to being significant at Doctoral institutions only. The sign has also changed from positive to negative. In a reversal from the results in Harter et al. (2011), speaking English as a second language is no longer a significant predictor of time allocated to teaching (nor time allocated to research). This holds for the full sample and for all Carnegie Classifications. A chi-squared test was performed to examine whether there is a statistically significant difference in the distribution of non-native English speakers across Carnegie Classifications. The test revealed that only Baccalaureate schools have a statistically significant difference, with fewer non-native speakers among their faculty. This also constitutes a change from Harter et al., with their tests showing a difference at both Associate's and Baccalaureate institutions.

Table 6.5 includes results for the regression for time allocated to research. Given the results of the model for time allocated to teaching it is not surprising how often rank is a significant predictor of research time. However, there are some differences worth noting between the two models. While the categorical variable for Female was not significant for time allocated to teaching, it was for time allocated to research at Master's institutions, with women allocating less time to research relative to their male colleagues. Next, though the weight of teaching in promotion and tenure was only significant at Master's and Doctoral institutions, the weight of research

Table 6.5. OLS Regression for individual and school variables: Dependent variable = percentage of time spent on research

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	-2.749	-1.224	-5.224*	-2.760
	(1.484)	(2.411)	(2.284)	(2.642)
Lecturer/Instructor/Adjunct	-26.104**	-17.282*	-35.105**	-31.058**
	(3.993)	(7.384)	(7.520)	(6.747)
Assistant Professor	-9.678*	-7.988	-18.939**	-12.945
	(3.901)	(6.139)	(6.940)	(6.906)
Associate Professor	-9.181*	-8.408	-22.390**	-8.463
	(3.648)	(5.423)	(6.418)	(6.701)
ESL	0.991	0.076	1.046	0.744
	(1.980)	(3.323)	(2.939)	(3.427)
Prorsch	0.226**	0.357**	0.180*	0.161**
	(0.034)	(0.086)	(0.071)	(0.050)
Experience	-0.201*	-0.414*	-0.077	-0.180
	(0.086)	(0.170)	(0.130)	(0.141)
Class size: Principles	-0.005	-0.084	0.063	-0.011
	(0.006)	(0.124)	(0.036)	(0.008)
Tenure-track teaching load	-1.170*	-0.488	-0.047	-2.026
	(0.458)	(0.862)	(0.620)	(1.063)
AEA Member	3.297*	2.078	2.109	4.515
	(1.476)	(2.462)	(2.184)	(2.658)
Constant	26.365**	27.055**	10.742	37.111**
	(4.116)	(8.209)	(6.221)	(7.752)
Adjusted R^2	0.257	0.245	0.248	0.245
Observations	502	129	135	230

Standard errors in parentheses
$^{*}p < .05$, $^{**}p < .01$

on promotion and tenure is a significant and positive predictor of time allocated to research at all types of institutions and for the whole sample. One potential explanation for the significance or lack thereof on both promotion variables is that in the 15 years since the 2005 iteration of the survey a greater proportion of faculty have self-selected into institutions that match their teaching preferences, and so the weight now has little to no impact. Another is the growing mismatch of time allocated to teaching and the promotion rewards to teaching. While time allocated to teaching at Doctoral institutions in 2020 was almost identical to 2005, the *weight* of teaching has fallen in those 15 years from approximately 30% to 22%.

6.6 The Interaction of Faculty Rank and Faculty Gender for Time Allocation

In keeping with the approach of Harter et al. (2011), both rank and gender exert at least some influence on time allocation by academic economists so an interaction term was included to explore whether men and women of different ranks allocate their time in different ways. Results for these models appear in Tables 6.6 and 6.7.

The only significant interaction effect on time allocated to teaching comes for female lecturers, instructors, or adjuncts at Baccalaureate institutions (a positive interaction) and female lecturers, instructors, or adjuncts at Master's institutions (a negative interaction). This represents another change from Harter et al. (2011). Just as in their work, an F-test was conducted to test the null hypothesis that the coefficients on Female; Female*Lecturer, Instructor, or Adjunct; Female*Assistant Professor; and Female*Associate Professor were all zeroes. For the results for all types of schools, the F-test returned an F value of 1.16 and a p value of 0.3291. For Baccalaureate institutions the F-test returned an F value of 2.15 and a p value of 0.0786. For Master's institutions F-test returned an F value of 1.64 and a p value of 0.1694. For Doctoral institutions F-test returned an F value of 0.77 and a p value of 0.5485. Therefore, the null hypothesis cannot be rejected.

Table 6.6. OLS regression with interaction terms investigating gender and rank: Dependent variable = percentage of time spent on teaching

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	6.279	4.097	8.881	4.729
	(3.224)	(5.142)	(5.274)	(5.511)
Lecturer/Instructor/Adjunct	31.581**	6.612	50.406**	37.792**
	(4.341)	(9.643)	(10.113)	(5.589)
Assistant Professor	13.624**	16.603*	14.305*	14.174**
	(3.636)	(7.090)	(7.021)	(5.300)
Associate Professor	6.801*	13.584*	3.451	7.334
	(3.280)	(6.352)	(5.043)	(5.363)
Female*	-10.135	41.176*	-29.203*	-13.307
Lecturer/Instructor/Adjunct	(6.252)	(19.179)	(13.584)	(8.663)
Female*	-5.219	0.264	-8.167	-5.146
Assistant Professor	(4.762)	(7.490)	(9.668)	(7.477)
Female*	-4.613	-10.337	-3.022	0.109
Associate Professor	(4.818)	(7.796)	(7.851)	(8.139)
ESL	-1.277	3.950	-1.021	-5.250
	(2.484)	(4.450)	(4.534)	(3.716)
Proteach	0.050	0.097	0.166	-0.240**
	(0.047)	(0.089)	(0.091)	(0.078)
Experience	0.142	0.454*	0.101	0.111
	(0.107)	(0.223)	(0.199)	(0.152)
Class size: Principles	-0.011	-0.149	-0.052	-0.001
	(0.008)	(0.161)	(0.055)	(0.009)
Tenure-track teaching load	1.147	1.003	-0.892	4.326**
	(0.588)	(1.050)	(0.972)	(1.196)
AEA Member	-2.575	2.262	-5.550	-5.392
	(1.852)	(3.241)	(3.386)	(2.875)
Constant	37.605**	33.654**	49.750**	29.543**
	(5.099)	(10.663)	(10.251)	(7.965)
Adjusted R^2	0.142	0.074	0.180	0.254
Observations	503	130	135	230

Standard errors in parentheses
* $p < .05$, ** $p < .01$

Table 6.7. OLS regression with interaction terms investigating gender and career paths: Dependent variable = percentage of time spent on research

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	-5.908*	-2.935	-3.678	-10.383*
	(2.571)	(3.917)	(3.687)	(5.047)
Lecturer/Instructor/Adjunct	-23.732**	-16.333*	-15.274*	-32.058**
	(3.422)	(7.117)	(7.081)	(5.102)
Assistant Professor	-6.021*	-9.242	4.536	-11.828*
	(2.922)	(5.404)	(4.930)	(4.885)
Associate Professor	-5.923*	-11.371*	1.512	-9.337
	(2.649)	(4.881)	(3.607)	(4.953)
Female*	6.593	-8.515	3.741	13.236
Lecturer/Instructor/Adjunct	(4.986)	(14.582)	(9.527)	(7.939)
Female*	3.645	2.169	-3.152	7.458
Assistant Professor	(3.808)	(5.678)	(6.782)	(6.896)
Female*	4.639	4.891	-3.997	12.466
Associate Professor	(3.856)	(6.002)	(5.501)	(7.462)
ESL	1.007	0.028	0.728	0.501
	(1.985)	(3.385)	(3.156)	(3.414)
Prorsch	0.231**	0.364**	0.171*	0.173**
	(0.034)	(0.086)	(0.077)	(0.050)
Experience	-0.217*	-0.417*	-0.073	-0.232
	(0.088)	(0.174)	(0.141)	(0.144)
Class size: Principles	-0.005	-0.079	0.057	-0.012
	(0.006)	(0.123)	(0.038)	(0.008)
Tenure-track teaching load	-1.182*	-0.420	-0.303	-2.015
	(0.464)	(0.867)	(0.666)	(1.065)
AEA Member	3.228*	2.369	1.740	4.433
	(1.482)	(2.493)	(2.347)	(2.635)
Constant	28.271**	26.591**	14.263*	40.416**
	(4.165)	(8.446)	(6.640)	(7.764)
Adjusted R^2	0.254	0.240	0.150	0.250
Observations	502	129	135	230

Standard errors in parentheses
* $p < .05$, ** $p < .01$

For time allocated to research none of the interactions of Female and rank were significant, which also constitutes a change since the 2005 data. Again, an F-test was conducted to test the null hypothesis that the coefficients on Female; Female*Lecturer, Instructor, or Adjunct; Female*Assistant Professor; and Female*Associate Professor were all zeroes. For the results for all types of schools, the F-test returned an F value of 1.54 and a p value of 0.1893. For Baccalaureate institutions the F-test returned an F value of 0.37 and a *p* value of 0.8314. For Master's institutions F-test returned an F value of 1.44 and a *p* value of 0.2246. For Doctoral institutions F-test returned an F value of 1.24 and a *p* value of 0.2953. Therefore, the null hypothesis cannot be rejected. These results suggest that though there are differences in the time allocations of males and females, and those of faculty at different ranks, within types of institutions any differences between the time allocations of males and females are minimal.

6.7 Determinants of Desired Time Allocation

Having updated the Harter et al. (2011) analysis of the 2005 quinquennial survey with the corresponding data from 2020, the next step in extending their work was to run the same regressions, this time with the responses from the question on desired time allocation as the dependent variable. Table 6.8 displays results for desired time allocated to teaching. The coefficient for Female is neither statistically significant in the whole sample nor at any Carnegie Classification. Similar to the regressions for actual time allocation, the rank of lecturer, instructor, or adjunct would like to teach more in the full sample and at all Carnegie Classifications, relative to full professors. Assistant professors would like to teach more in the full sample and at Master's institutions. Associate professors would like to teach more at Master's institutions.

Table 6.8. OLS Regression for individual and school variables: Dependent variable = desired percentage of time spent on teaching

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	1.612	1.015	3.580	-0.071
	(2.081)	(3.484)	(4.138)	(3.085)
Lecturer/Instructor/Adjunct	31.722**	34.484**	41.359**	34.733**
	(3.793)	(9.557)	(8.977)	(4.784)
Assistant Professor	11.428**	21.490**	15.294*	11.523*
	(3.495)	(6.937)	(6.965)	(4.944)
Associate Professor	5.513	13.879*	3.721	7.296
	(2.889)	(5.516)	(4.927)	(4.476)
ESL	-3.496	3.606	-5.537	-4.682
	(2.790)	(4.946)	(5.462)	(3.993)
Proteach	0.105*	0.260*	0.258*	-0.223**
	(0.052)	(0.100)	(0.107)	(0.084)
Experience	0.365**	1.056**	0.447	0.214
	(0.118)	(0.245)	(0.231)	(0.161)
Class size: Principles	-0.004	0.191	-0.102	0.006
	(0.009)	(0.181)	(0.064)	(0.010)
Tenure-track teaching load	1.160	0.555	-1.053	4.708**
	(0.650)	(1.178)	(1.133)	(1.282)
AEA Member	-3.516	-0.375	-3.423	-5.507
	(2.065)	(3.606)	(3.960)	(3.095)
Constant	27.584**	-0.764	37.567**	21.078*
	(5.559)	(11.644)	(11.871)	(8.350)
Adjusted R^2	0.141	0.159	0.148	0.240
Observations	502	130	134	230

Standard errors in parentheses
* $p < .05$, ** $p < .01$

Experience is now significant for the full sample, and its impact on the desires of faculty at Baccalaureate institutions has doubled relative to actual time allocation. The weight of teaching on promotion and tenure decisions has gone from being significant only at Master’s and Doctoral institutions to being significant for the whole sample and for all Carnegie Classifications. Participants at Doctoral institutions continue to exhibit an inverse response to the weight of teaching in promotion and tenure.

Table 6.9 shows the results of the model for desired time allocated to research. In the model for actual time allocated to research, the coefficient for Female was significant only for female faculty at Master's institutions. For desired time allocated to research, the coefficient for Female is significant in the full sample and at all types of institutions but Doctoral. Next, the coefficient for lecturers is still significant and negative for the full sample and at all Carnegie Classifications. The size of all coefficients has grown, however, relative to the actual time allocation regressions. There are numerous reasons one may work at the rank of lecturer, instructor, or adjunct: preference for teaching, job availability, not enough of a publication history to earn a tenure-track position, etc. The direction and magnitude of the Lecturer, Instructor, or Adjunct coefficient indicates that the first possibility is likely the most common among respondents in this sample. Experience has gone from being a significant predictor only for the whole sample and faculty at Baccalaureate institutions to being a significant predictor across the whole sample and all Carnegie Classifications. Each year of experience corresponds to desiring to allocate less time to research. This is not surprising considering that as faculty gain tenure their publishing requirements and the stakes for meeting them both decrease. Compared to the model for actual time allocated to research, the coefficient on the weight of research in promotion and tenure has gone from being significant in the whole sample and all types of institutions to being significant only for the sample as a whole. The preference of non-native English speakers has also changed relative to the actual time

Table 6.9. OLS regression for individual and school variables: Dependent variable = desired percentage of time spent on research

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	-5.951^{**}	-7.976^{*}	-8.920^{**}	-3.655
	(1.997)	(3.475)	(3.371)	(3.389)
Lecturer/Instructor/Adjunct	-28.246^{**}	-26.044^{*}	-43.953^{**}	-29.254^{**}
	(5.377)	(10.693)	(11.098)	(8.649)
Assistant Professor	-10.641^{*}	-4.366	-23.003^{*}	-13.649
	(5.254)	(8.884)	(10.241)	(8.858)
Associate Professor	-8.230	-10.954	-18.085	-4.520
	(4.910)	(7.870)	(9.471)	(8.591)
ESL	5.930^{*}	1.446	8.652^{*}	4.751
	(2.664)	(4.816)	(4.338)	(4.393)
Prorsch	0.173^{**}	0.237	0.157	0.071
	(0.045)	(0.124)	(0.105)	(0.064)
Experience	-0.432^{**}	-0.561^{*}	-0.521^{**}	-0.362^{*}
	(0.117)	(0.244)	(0.192)	(0.182)
Class size: Principles	-0.000	-0.020	0.073	-0.011
	(0.008)	(0.178)	(0.053)	(0.010)
Tenure-track teaching load	-1.202	-0.502	0.747	-2.875^{*}
	(0.616)	(1.246)	(0.915)	(1.365)
AEA Member	4.372^{*}	7.269^{*}	1.810	3.673
	(1.989)	(3.558)	(3.223)	(3.420)
Constant	41.149^{**}	37.277^{**}	24.206^{**}	59.820^{**}
	(5.555)	(11.918)	(9.180)	(9.964)
Adjusted R^2	0.179	0.221	0.222	0.139
Observations	502	130	135	229

Standard errors in parentheses
* $p < .05$, ** $p < .01$

allocation regressions, with non-native speakers in the full sample showing a statistically significant preference to increase their research time.

6.8 The Interaction of Faculty Rank and Faculty Gender for Desired Time Allocation

Just as with the analysis of actual time allocation, an analysis of the data was performed including the interaction of rank and gender and the impact on preferred time allocation. Table 6.10 includes the results of including this interaction in the

Table 6.10. OLS regression with interaction terms investigating gender and rank: Dependent variable = desired percentage of time spent on teaching

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	4.593	-1.500	9.441	3.389
	(3.624)	(5.772)	(6.334)	(5.886)
Lecturer/Instructor/Adjunct	37.699**	25.679*	55.145**	42.778**
	(4.842)	(10.825)	(11.900)	(5.969)
Assistant Professor	11.591**	16.985*	15.367	11.822*
	(4.056)	(7.959)	(8.261)	(5.661)
Associate Professor	6.878	16.085*	6.763	4.165
	(3.659)	(7.131)	(5.934)	(5.728)
Female*	-13.732*	35.987	-29.334	-19.348*
Lecturer/Instructor/Adjunct	(6.988)	(21.529)	(16.008)	(9.252)
Female*	-0.861	7.502	-2.899	-2.886
Assistant Professor	(5.331)	(8.408)	(11.422)	(7.985)
Female*	-4.022	-4.105	-10.216	4.065
Associate Professor	(5.393)	(8.751)	(9.311)	(8.693)
ESL	-3.454	2.455	-6.615	-4.578
	(2.790)	(4.995)	(5.478)	(3.969)
Proteach	0.112*	0.234*	0.247*	-0.227**
	(0.052)	(0.100)	(0.107)	(0.084)
Experience	0.371**	0.981**	0.410	0.198
	(0.119)	(0.250)	(0.235)	(0.162)
Class size: Principles	-0.001	0.169	-0.119	0.010
	(0.009)	(0.181)	(0.065)	(0.010)
Tenure-track teaching load	1.226	0.676	-0.960	4.937**
	(0.655)	(1.179)	(1.146)	(1.277)
AEA Member	-3.375	-1.126	-2.710	-5.612
	(2.066)	(3.638)	(3.993)	(3.070)
Constant	25.666**	4.078	37.378**	19.204*
	(5.692)	(11.970)	(12.062)	(8.507)
Adjusted R^2	0.143	0.169	0.154	0.253
Observations	502	130	134	230

Standard errors in parentheses
* $p < .05$, ** $p < .01$

regressions for desired time allocated to teaching. The model finds a significant negative effect of the interaction only for females who are lecturers, and only for the full sample and at Doctoral institutions. Just as in the interaction regressions for actual time allocations, an F-test was conducted to test the null hypothesis that for desired time allocated to teaching the coefficients on Female; Female*Lecturer, Instructor, or Adjunct; Female*Assistant Professor; and Female*Associate Professor were all zeroes. The F-test for all types of schools returned an F value of 1.21 and a p value of 0.3039. For Baccalaureate institutions the F-test returned an F value of 1.13 and a *p* value of 0.3450. For Master's institutions F-test returned an F value of 1.17 and a *p* value of 0.3273. For Doctoral institutions F-test returned an F value of 1.66 and a *p* value of 0.1598. Therefore, the null hypothesis that male and female faculty do not differ in their desired time allocated to teaching cannot be rejected. This result fits with the fact in the model including the interaction the coefficient on Female was statistically significant for neither the whole sample nor any Carnegie Classification.

Table 6.11 displays the results from the model for desired time allocated to research including the rank and female interaction. There are few meaningful differences between the results of this model and the one without the interaction. Also, the interaction of Female and rank was significant only for the rank of lecturer, and only in the full sample and at Doctoral institutions. Again an F-test was completed and for all types of schools returned an F value of 3.75 and a *p* value of 0.0052. For Baccalaureate institutions the F-test returned an F value of 1.63 and a *p* value of 0.1707. For Master's institutions F-test returned an F value of 1.83 and a *p* value of 0.1268. For Doctoral institutions F-test returned an F value of 1.72 and a *p* value of 0.1457. Therefore, the null hypothesis that male and female faculty do not differ in their desired time allocated to research can only be rejected for the full sample.

Table 6.11. OLS regression with interaction terms investigating gender and career paths: Dependent variable = desired percentage of time spent on research

Variable	All Carnegie Classifications	Baccalaureate Carnegie Classification	Master's Carnegie Classification	Doctoral Carnegie Classification
Female	-10.988**	-10.275	-7.720	-14.666*
	(3.451)	(5.698)	(5.257)	(6.459)
Lecturer/Instructor/Adjunct	-29.645**	-22.622*	-27.848**	-37.742**
	(4.594)	(10.322)	(10.099)	(6.531)
Assistant Professor	-8.298*	-4.147	-1.880	-17.080**
	(3.929)	(7.828)	(7.031)	(6.283)
Associate Professor	-4.335	-8.301	2.893	-8.009
	(3.548)	(7.039)	(5.144)	(6.351)
Female*	15.220*	-6.483	6.010	23.911*
Lecturer/Instructor/Adjunct	(6.684)	(21.210)	(13.586)	(10.135)
Female*	7.187	5.935	-3.658	11.678
Assistant Professor	(5.108)	(8.262)	(9.672)	(8.809)
Female*	4.030	0.795	-3.066	12.711
Associate Professor	(5.162)	(8.645)	(7.844)	(9.534)
ESL	5.865*	0.900	8.468	4.251
	(2.660)	(4.915)	(4.501)	(4.355)
Prorsch	0.177**	0.244	0.146	0.082
	(0.045)	(0.125)	(0.109)	(0.064)
Experience	-0.455**	-0.565*	-0.509*	-0.416*
	(0.118)	(0.251)	(0.202)	(0.185)
Class size: Principles	-0.002	-0.031	0.069	-0.014
	(0.008)	(0.178)	(0.054)	(0.010)
Tenure-track teaching load	-1.289*	-0.402	0.516	-2.895*
	(0.621)	(1.258)	(0.950)	(1.360)
AEA Member	4.299*	7.817*	1.379	3.781
	(1.987)	(3.613)	(3.346)	(3.372)
Constant	44.342**	37.905**	27.229**	63.928**
	(5.596)	(12.293)	(9.469)	(9.931)
Adjusted R^2	0.183	0.211	0.179	0.153
Observations	502	130	135	229

Standard errors in parentheses
* $p < .05$, ** $p < .01$

6.9 Discussion

Relative to the 1995, 2000, and 2005 data Harter et al. (2011) analyzed, the 2020 quinquennial survey data continues to show that rank is a better predictor than gender of the proportion of time one allocates to teaching. In fact, many of the coefficients on Assistant and Associate Professor that were not significant in Harter et al. have become so. These new results could indicate self-selection into the rank and responsibilities one desires. The Female*rank interaction still returns some statistically significant results, but fewer than in the previous study. This trend continues in the regressions for preferred time allocation as well. One possible explanation is that the breakdown of women and men in this sample is different from that of the Harter et al. analysis. They employed a chi-squared test revealing a statistically significant difference in the breakdown of professor gender for different Carnegie Classifications. The 2020 data does not show a similar distribution. In addition to resulting from the proportion of males and females in this sample being virtually the same across the classifications, the significance of rank more than gender may also show that there has been some progress in the proportion of women working at Doctoral institutions. Since the 2005 survey, the female proportion of faculty at Doctoral institutions has climbed from 20.3% to 25% (Chevalier, 2022).

One important caveat here is that the quinquennial survey asks respondents for percentages of time as opposed to absolute hours per week. Exploring the latter may offer additional insights. Actual time allocation can differ greatly from one faculty member to another, even as their percentages look similar. Also, previous research conducted in terms of hours has found that women allocate more hours to teaching and less to research relative to their male peers (Link, Swann, & Bozeman, 2008). Even though there is little difference in this sample between the proportion of time females and males allocate to teaching, females do allocate less time to research. They also allocate and want to allocate more time to service. Next, the headwinds that women face in the economics discipline have been well documented (see Antecol, Bedard, & Sterns, 2018; Dupas et al., 2021; Moore, Song, & Whitney, 2021; and Sarsons, 2017 for examples), and another possibility is that women are allocating similar hours to research but more to teaching, relative to their male colleagues, in order to combat those headwinds.

The impact of the weight of teaching in promotion and tenure is another difference worth exploring. Harter et al.'s (2011) results showed teaching weight as significant for the whole sample and for each type of institution, whereas in the 2020 data the coefficient is significant only for Master's and Doctoral institutions (model without Female*rank interaction) or only for Doctoral institutions (model with Female*rank interaction). These results together suggest that faculty self-selecting into the rank and responsibilities they desire. The infrequency of significance of promotion and tenure weights also fits with the desired movement toward the incentive structure indicated in the descriptive statistics on preferred time allocation. Across the entire sample and at all Carnegie Classifications participants indicated a desire to lessen their teaching time to more closely match the weight teaching receives in promotion and tenure. Similarly, the change in the sign on the coefficient for Doctoral institutions, both for actual and desired time allocation, may be the result of academic economists becoming even more intentional in self-selecting into the kinds of departments that match their preferences (Bentley & Kyvik, 2013; Stupnisky, BrckaLorenz, Yuhas, & Guay, 2018). The variety of perspectives on the relationship between teaching and research could also be exerting an influence. Among survey respondents, 171 reported their ideal time allocated to research as 0%, while 71 reported their ideal time allocated to teaching as 0%. In other words, for some economists, research and teaching are complementary activities and for others they are mutually exclusive (Gautier & Wauthy, 2007), similar to a work/leisure dichotomy. Of the 71 who would like to allocate none of their time to teaching, 50 come from Doctoral institutions.

Gautier and Wauthy (2007) argue that the way teachers allocate their time reflects incentives and preferences. This study does not contradict that. Even though the weight of teaching for promotion and tenure did not predict actual time allocation, it was a significant predictor of desired time allocation. It is also important to remember that academic economists experience more incentives than simply promotion and tenure. Respect in one's department, among peers, and in the larger discipline also plays a role (Stupnisky et al., 2018; Webber, 2019; Webber & Rogers, 2018). It's also possible that for some faculty, promotion and tenure weights appear one way on paper and another in practice, and it is impossible to know in such cases which weight respondents are reporting. Furthermore, academic economists' general distaste for teaching is well documented (Allgood & Walstad, 2013; Walstad & Allgood, 2013), as is the phenomenon of the stated importance of teaching in tenure considerations being inflated by public relations concerns or serving as little more than lip service (Harter, Schaur, & Watts, 2015; Roberts, 2021).

Even if the written percentage and respondent reporting on the promotion and tenure weights they face were both accurate, there is still much that shapes preferences, and thus responses about time allocation, that the survey does not explore. The literature in behavioral psychology suggests that person/environment fit, income and relative income, personality, the feeling that one's work is important, and domestic life could all be exerting an influence on work hour allocation (Angrave & Charlwood, 2015; Pouwels, Kuroda & Yamamoto, 2019; Siegers, & Vlasblom, 2008). Furthermore, previous work has found that personal interests influence time allocation (Bentley & Kyvik, 2013). Similarly, one's preferences are often shaped by one's training (Forest, 2002), and previous research has shown a dearth of training in teaching and pedagogy received by economics Ph.D. students (Allgood, Hoyt, & McGoldrick, 2018; McGoldrick, Hoyt, & Colander, 2010; Walstad & Becker, 2010). Departmental culture also exerts an effect on the preference for teaching and research, person/environment fit, and training via mentoring relationships (Kessler et al., 2014; Stupnisky et al., 2018). Some of those are areas in which future iterations of the quinquennial survey could delve. However, every additional question increases the opportunity cost of filling out the survey and could lower the response rate.

There are limitations to this analysis. The data comes from an opportunistic sample. If respondents to this survey are indeed those more likely to care about their teaching, their response to questions of the impact of teaching weight will not be representative of all academic economists. There is also a possibility of reporting error. Not only could this apply to the objective measure of one's actual time allocation, but also tenure and promotion weights. As mentioned above, it is impossible to know whether a participant is reporting those weights as officially laid out or as anecdotally or informally understood by faculty in a particular department. Next, as described above, the responses of faculty who do not have the chance of promotion could have an effect on the accuracy of promotion and tenure weight variables. Finally, the subjective nature of desired time allocation could make that a variable in flux at various times in the semester. Survey questions have been carefully worded, but there may still be an opportunity for minimal changes that could improve accuracy. Follow up questions could help although additional questions come with tradeoffs.

This study also presents opportunities for future research. The downward trend in the weight of both teaching and research for promotion and tenure at Doctoral institutions is worth more thorough analysis. Does the trend hold for faculty beyond respondents to this survey? Are the responses of non-tenure-track faculty, and the growing use of non-tenure-track faculty at larger research institutions, exerting a meaningful downward pull on averages? Is the tenure landscape in general shifting in response to budgetary and political concerns? The answers to these questions are connected to one another and the broader higher education landscape. Next, this analysis is situated into the larger subject of the gender gap in economics. The coefficient on Female was not significant in any of the teaching time regressions, but was significant for many of the research time regressions. In fact, female faculty appear to want to allocate even less time to research than they currently allocate, and less than their male counterparts. These results indicate that the preference for teaching expressed by female faculty in Forest's (2002) analysis may be weakening. Across the whole sample the mean desired percentage devoted to teaching for female and male faculty is 45.1 and 44.1 respectively. However, the medians are 47.5 and 40 respectively. Again though, much of those differences disappear once respondents have been broken down by rank. In other words, the preference for teaching is complicated and is worth further exploration.

Harter et al. (2015) argue, "If, or quite likely when, departments and schools view teaching weights as a discretionary policy tool, the chances for successful implementation are likely to depend on adapting the policies to fit the particular characteristics of the school and department, and perhaps even individual faculty members" (p. 321). Link, Swann, and Bozeman (2008) add, "The appropriate policy response depends on the reasons for different time allocations" (p. 374). Unfortunately, unionization means that tailored responses are often discounted or difficult to implement (Becker, 1979). They also often require a time investment that poses too high an opportunity cost for many departments. As Becker points out, "Reduced screening renders impotent the university's power to increase faculty output through changes in the income weighting given to teaching and research" (p. 1016). This is even more the case today given the way faculty of different preferences have siloed themselves in departments that match those preferences. Any efforts to move the needle on allocating time to teaching in meaningful ways, improving instructional variety, and engaging in sound pedagogy will require more than the adjustment of tenure-related or monetary incentives (Forest, 2002). It will require the discipline as a whole, or at least individual departments, to develop a "supportive teaching culture" (Wilkesmann & Schmid, 2014, p. 20) in the form of improved training, mentoring, and respect for excellent economics instruction.

Chapter 7

CONCLUSION

7.1 Introduction

Chapter 4 analyzes the ways economics instruction and assessment differs across schools of varying Carnegie Classifications. The findings suggest that there are meaningful differences across the classifications. Generally, the differences occur in terms of Doctoral institutions relative to the other types, and Baccalaureate institutions relative to the other types. Faculty at Doctoral institutions are more likely to lecture a large majority of the time, and less likely to employ methodological variety, either in their instruction or assessment choices. Faculty at Baccalaureate institutions are the least likely to employ lecture a majority of the time and more likely to engage in methodological variety. Though there are some subtle differences across different course levels, in practical terms faculty at Doctoral institutions are less likely to use discussion, cooperative learning, and any kind of assessment that uses oral presentations or writing assignments of any kind. The opposite is true for faculty at baccalaureate institutions. The findings also indicate that though the results from the 2020 iteration of the quinquennial survey are quite similar to those from the 2010 iteration, there have been some meaningful changes in the intervening 10 years. Faculty at all types of institutions have generally increased their use of cooperative learning strategies. In regard to their grading methods, the proportion of faculty who indicate that they make use of writing assignments of any length has decreased at all types of institutions. The use of oral presentations and the inclusion of participation in the course grade have also increased.

Chapter 5 examines the role that professor gender plays in the choice of instruction and assessment methods. The results in this chapter suggest that female faculty are more likely than their male peers to deviate from the standard economist practice of teaching through chalk and talk, and to employ methodological variety. Any method that involves interaction or verbal skills is more likely to be employed by a female instructor. More specifically, that means student-to-student discussion, cooperative learning strategies, active learning strategies, written assignments, and oral assignments are all more common among female faculty. Female faculty are also more likely to give verbal, written, or collaborative work greater weight in the calculation of the semester grade. These trends hold across Carnegie Classifications and course levels.

Chapter 6 explores the determinants of the actual time allocation of economics faculty, the determinants of their preferred timeout location, and the meaningful differences between those two sets of variables. The results suggest that faculty at all Carnegie Classifications teach more and research less than those at Doctoral institutions. Next, the differences between the time that female and male faculty allocate to teaching and want to allocate to teaching are minimal at most. However, female faculty research less. They would also like to research less than they do, and research less than male faculty. The results also provide an unclear picture of the role promotion and tenure incentives play in faculty time allocation and preferences. Academic economists allocate more time to teaching and less time to research than one might expect given the promotion and tenure weights that they face. However, their desired time allocation shows movement toward their promotion and tenure weights. Promotion and tenure incentives for time allocated to research outstripped time allocated to teaching. The reverse was true for desired time allocations for both activities. Rank appears to be the strongest predictor of academic economists' actual and desired time allocation.

Two threads run throughout the essay chapters: the influence of departmental culture, ethos, and/or mission; and the ways that female faculty contribute to and experience the discipline of economics.

7.2 Institutional Ethos

Previous research has found that institutional ethos influences student engagement, student learning, and faculty decision making (Kezar & Kinzie, 2006; Kuh, 2003; Kuh & Hu, 2001; McCormick et al., 2009; Pike et al., 2007). Unfortunately, even before the Boyer Commission report on the state of education at larger research institutions, the conventional thinking claimed that the institutional ethos of Doctoral institutions focused almost entirely on research, at the expense of excellent undergraduate education; that if a student wanted faculty who cared about them and cared about teaching that student should attend a smaller, often liberal arts school. The findings of this dissertation support this thinking to a large degree. Chapter 4 suggested that faculty at every Carnegie Classification employ greater methodological variety than their peers at Doctoral institutions. Also, Chapter 6 showed that Doctoral faculty may research more and teach less than faculty at other classifications. Doctoral faculty may also want to teach less than they do, teach less than others, and reallocate a greater proportion of their time to research than other faculty. This divide is illustrated in simple terms in the descriptive statistics. The divide also appears in the sign on the coefficient for the weight of teaching in promotion and tenure in the regressions for desired time allocation. Respondents from all Carnegie Classifications indicated a desire to teach less and to move their time allocation toward the promotion and tenure weights at their respective institutions (only for Doctoral faculty was sign for teaching negative). One possible explanation is that Doctoral faculty are simply not moved by the weight teaching will carry in tenure decisions because they are being evaluated on, and most want to allocate their time to, research, and the magnitude of both of those factors is simply stronger than any incentive to teach. Another possibility is that the minimum rating required for course evaluations is so low as to be meaningless. Finally, faculty may believe that no matter what the stated weight for teaching is, the actual weight is far lower, and perhaps nonexistent.

As Asarta et al. (2018) argue, it doesn't have to be this way. The dominant narrative about and in Doctoral institutions can be one of leveraging their research expertise to produce scholarship on innovative and effective education. In this, Asarta et al. echo the work of Kezar and Kinzie (2006) when they said, "Research universities can use their research activities and the plethora of campus resources (e.g., museums, labs) to create an environment of unparalleled challenge, active learning, and interaction" (p. 170). McCormick et al. (2009) put it even more forcefully: "[D]epartments that serve both undergraduate and graduate students must attend more to the intellectual needs of undergraduates" (p. 155). The question Kuh (2003) poses is, are colleges and their faculty willing to make the effort that strong educational practices demand?

7.2.1 Policy Recommendations

In his analysis of the higher education landscape *Impostors in the Temple* (1996), economist Martin Anderson begins his recommendations with an excoriation of those at the top: trustees and boards of governors. As well intentioned as his recommendation is, aiming at that level of the hierarchy of control is far beyond faculty and department chairs of an economics department. However, there are other changes an institution interested in changing their ethos could take. The first involves resisting and changing incentives. The incentives these institutions would have to resist are those established by the Carnegie Classification system itself. Despite Carnegie's insistence to the contrary, universities—and the public—continue to view the range of classifications as a hierarchy, a ladder to be climbed. Greater prestige awaits those who can ascend. The path to ascent does not involve any kind of benchmarks related to teaching. Nor do improvement plans for universities. Institutions are therefore placed in a position where efforts to increase their standing and increase enrollments mean at least to some degree downplaying the central purpose of what a university is supposed to be: a place of education. The incentives universities could change are those surrounding tenure and promotion. These changes could take several forms. First, either increase (or abide by) the weight that teaching exerts in promotion and tenure decisions. The findings in chapter 6 provide reason to believe that there is a disparity between the actual and articulated weight of teaching. If departments actually began to deny tenure for teaching ineffectiveness, behavior by faculty may adjust accordingly. However, even if the reported weights exactly match the practice of economics departments, and the weight placed on teaching will not create movement, incentives related to pay raises could. Second, departments could also hire more lecturers or teaching faculty, and raise these individuals' standing in the department. The findings in chapter 6 suggest that there are academic economists who want to prioritize and/or specialize in teaching, who derive professional value from teaching, and who want to invest more time in it. The findings also indicate that many respondents are primarily or exclusively interested in teaching, The data also suggests that many respondents in teaching positions have no path to promotion or tenure. Institutions therefore have an opportunity to rethink departmental structure and the incentives that it creates. A tenure track for excellent educators could increase the talent pool for teaching-focused positions and improve the quality of economics instruction. This is not at all to suggest departments must therefore relax a commitment to excellence in research. As Gautier and Wauthy (2007) have argued, there does not have to be a trade-off between teaching and research, or even between teaching funding and research funding. Departments could also create research fellow tenure tracks for economists who want to focus solely on research.

In addition to adjusting and resisting incentives, institutions who want to alter their ethos to one that values undergraduate education should consider changing the way they train Ph.D. students and newly minted Ph.D. hires. Research has found that no more than half of new faculty feel that their coursework prepared them to teach (Allgood, Hoyt, & McGoldrick, 2018a). Training could take the form of requiring a course in one's graduate work that focuses on effective teaching, complete with observations and mentoring from professors with an established reputation for teaching excellence. One course in teaching will of course not turn graduate students into master teachers. However, a required course provides a foundation from which a graduate student can draw and upon which future professional development can build (Walstad & Becker, 2010). Teaching mentors should also be assigned to new hires.

This is a practice regularly implemented by just one quarter of economics departments in a recent survey (Allgood, Hoyt, & McGoldrick, 2018b). The potential benefits of mentoring include increased teaching effectiveness (McMurtrie, 2014; Zellers, Howard, & Barcic, 2008), a more supportive departmental environment (Boyle & Boice, 1998; Zellers et al.), and increased retention rates, productivity, and job satisfaction (Melicher, 2000; Zellers et al.). Departments could also link the mentoring and training to the hiring of more teaching faculty. Beyond graduate coursework and mentoring, research also shows that there are benefits to continued faculty training opportunities, and if implemented correctly are viewed favorably by participants (Walstad & Salemi, 2011). Given the impact of training on one's view of teaching (Forest, 2002), each of these measures has the potential to increase individual faculty members' investment in their teaching.

7.3 The Contributions and Experiences of Female Economics Faculty

The findings of chapter 5 confirmed that female economics faculty teach and assess undergraduate economics differently than their male colleagues. They engage in greater methodological variety, particularly when it comes to methods involving cooperative learning, active learning, collaboration, and verbal skills. The findings from chapter 6 showed that female faculty also allocate their time differently and have different time allocation preferences than their male colleagues. However, chapter 6 also showed that the standard generalization that female faculty want to teach and male faculty want to research is not that simple. Female faculty want to research less than they do, but they don't evince an obvious desire to teach more, or more than their male colleagues. This dichotomy lends credence to the view that female academic economists invest time into their teaching to combat the headwinds they face in the discipline.

7.3.1 Policy Recommendations

Research in general pedagogy, math education, and economic education suggests that the methods women employ more often are the ones that increase student engagement and instructor effectiveness (see Bodary & Gross, 2018; Freeeman et al., 2014; Hiebert & Grouws, 2007; McCormick et al., 2009; Marburger, 2005; and others). Economics departments should reward this excellence in teaching. Strategies for accomplishing this are above.

Other policy prescriptions more or less fall along the lines of addressing the headwinds that female economists face and attracting more women to the profession. Previous work indicates that female economics faculty face bias in student evaluations of teaching (Buser, Batz-Barbarich, & Hayter 2022; Keng, 2020), and economics departments should reform course evaluations and assessment of teaching effectiveness in general to account for that bias. Recent research has also shown that female economists face a more hostile environment when presenting at conferences (Dupas, Modestino, Niederle, & Wolfers, 2021). Though departments have no control over the bias their faculty face outside of the campus, departmental leadership can and should still evaluate the degree to which their promotion and tenure structures, incentives, and departmental culture create divergent expectations and rewards for their male and female faculty. Examples of this include, but of course are not limited to, co-authorship bias (Sarsons, 2017) and the view that the fields female economists tend to research do not have the prestige of the research interests of their male colleagues (Sierminska & Oaxaca, 2021). Departments should also address some of their well-intentioned policies that harm the retention of female faculty. Among these are policies aimed at putting female faculty into student-facing service roles. The objective of these policies is to give female students more opportunities to interact with female faculty, but the result is to create a hidden workload that decreases female faculty's chances of earning tenure (Hamermesh, 2005; Tierney and Bensimmon, 1996). Another example of a policy with unintended consequences is the gender-neutral stopping of tenure clocks. Research has shown that the result is increased tenure rates for male faculty and decreased rates for female faculty (Antecol, Bedard, & Stearns, 2018). Finally, departments should appoint both a teaching and research mentor to newly hired female faculty. The benefits of mentorship are outlined above, and for female faculty those benefits could be even more meaningful.

Other policy recommendations closely follow those that would address the gender gap in economics. Some of these, such as expanding the number of high school economics courses and improving the quality of economics instruction at this level (Ashworth & Evans, 2001; Butters, Asarta, & Thompson, 2013; Malgwi, Howe, & Burnaby, 2005), are mostly beyond the reach of economics departments themselves. Others are more attainable with reasonable or even minimal investment. First, simply providing female students with information about the major increases female presence in the major (Bayer, Bhanot, & Lozano, 2019). Second, giving more attention to the social welfare elements of the discipline can also make the discipline more accessible to female students (Bansak & Starr, 2010). This can be accomplished in classes themselves, but also by teaching more electives that focus on these elements (Jones et al., 2008). Next, related to lower female representation in "prestige" research areas, the same reorientation to the social welfare aspects of economics in general could be undertaken for research in macroeconomics, monetary economics, finance, and other specialties currently more occupied by males in the field. Others have argued that reducing the quantitative requirements could result in female students persisting in the economics major (Fiegenbaum, 2013). However, recent work has shown that the accuracy of the quantitative requirements hypothesis varies by course and type of institution (Emerson et al., 2018). A more effective course of action may be to have both a humanities-oriented and quantitative economics degree (Ahlstrom & Asarta, 2019).

7.4 Limitations

7.4.1 Threats to Internal Validity

Data for each of the essay chapters in this dissertation relies on responses to a survey sent to a wide and varied group of economists. The sample is therefore opportunistic. Additionally, responses are entirely self reported. It is therefore impossible to know just how accurate those responses are. This is particularly true for questions that ask faculty to rate how frequently they use particular teaching methods. Previous research provides evidence that faculty self-perception is imperfect (Sheridan & Smith, 2020). There is also the potential for respondents to interpret questions differently than intended, and differently than other respondents. For example, for some educators the term active learning applies to anything other than direct lecture. The survey however differentiates active learning from cooperative learning and from games and experiments. Also, for responses to questions about the weight of various activities in promotion and tenure decisions and raises, some participants may have reported the weights as they appear in departmental contracts, while others may have reported faculty perception of weights in practice. Finally, not all respondents answered all questions. This means that the initial 1,664 responses declined to 1,138 for the analysis in chapters 4 and 5, and to less than 900 for the time allocation questions for chapter 6.

Related, the large number of individuals in the sample from Doctoral institutions could be biasing the results. Despite the intuition that the instructors most likely to respond to a survey of this kind are those that care about teaching, the persistent lack of methodological variety could be an effect of this oversampling. Furthermore, the intuition about respondents is at odds with the relatively large number of respondents who indicated that their ideal proportion of time allocated to teaching is 0%.

7.4.2 Threats to External Validity

The opportunistic sample means it is impossible to know just how representative this sample is of the discipline of economics as a whole. In some ways it is almost certainly different. First, as has been stated before, the intuition of previous work focused on the quinquennial survey has been that those most interested in their teaching are those most likely to respond. Second, the proportion of females in the sample is almost identical across Carnegie Classifications. However, data on the profession as a whole shows that female faculty are not equally distributed across type of institution (Chevalier, 2022). Finally, the harvesting of emails from department websites meant that faculty whose departments hide email addresses from the public did not receive invitations to complete the survey. It is possible that there is some trait shared by those schools that hide faculty email addresses that makes those schools different from others in the sample.

7.5 Implications for Future Research

In addition to the questions for future research specific to each essay chapter, there are others that arise from connections between chapters. First, the role that training plays in one's teaching and preference for teaching vs. research has ramifications for all three essay chapters. Future iterations of the quinquennial survey could explore this by simply adding a question on respondents' satisfaction with their training to the demographic section on one's educational background. Next, chapters 5 and 6 together raise questions of just how much of an academic economist's career track is the result of self-selection into the kind of job or responsibilities they desire, or the result of accepting the best option available to them. This is particularly true for female economists. This question highlights the continued potential for exploring the gender gap in economics and the divergent experiences in and pathways to the discipline for female faculty relative to their male colleagues. On a related note, do the differences between the results in this dissertation and the previous work of Harter et al. (2011), Schaur et al. (2012), Harter et al. (2015) indicate progress on the gender gap, or are they simply more results operating in tension with previous work? The results from chapters 5 and 6 also highlight the fact that faculty for whom English is a second language have a distinct experience in economics. This is a subject worth greater exploration. Finally, the findings in all three essay chapters invite greater analysis of the ranks of lecturers, instructors, clinical faculty, adjunct faculty, and similar teaching-focused roles. Specific topics include the career paths and promotion opportunities for lecturers, an examination of the schools that make use of lecturers, the responsibilities involved, and what variables predict an institution having a promotion track for lecturers.

7.6 Conclusions

The outlook is not entirely bleak. Economics departments that place a high value on teaching excellence do exist among the ranks of Doctoral institutions. Though there is not (yet) any empirical work identifying or ranking these departments, reputationally and anecdotally the University of Wisconsin-Madison, University of Tennessee-Knoxville, and University of North Carolina-Chapel Hill enjoy reputations for valuing innovative and quality instruction. They are also places where teaching faculty report high satisfaction and a sense that they are valued members of the department. There are others as well. Professional organizations also exist which actively seek to support the careers of women in economics and highlight the disparate challenges they experience in the discipline. The University of Wisconsin is a leader on this front with their Women in Economics (WE) initiative. Additionally, the American Economics Association's Committee on the Status of Women in the Economics Profession (CSWEP) and Diversifying Economic Quality (DivEQ), as well as the Federal Reserve Bank of St. Louis' Women in Economics, have established themselves as respected bodies in the field. Those departments or individuals interested in changing both the methodological landscape and the status quo for women in, and not yet in, the field have models to follow.

In their review of the literature on student success, Kuh et al. (2006) assert that "Most of the scholarship on teaching and learning indicates that the passive lecture format where faculty do most of the talking and students listen is contrary to almost every principle of an optimal learning environment" (p. 68). Becker and Watts (1996) add this straightforward imperative in the first article based on quinquennial survey data: "Great orators should continue to lecture, but…the rest of us should consider using a wider variety of teaching methods, and using them more often, to actively engage students." The ultimate purpose of this dissertation has been in service of that goal of increasing methodological variety. The lingering question is not whether a variety of methods can bring about greater learning, greater engagement, and a lasting positive view of economics by the students we serve. The question isn't even whether change is possible. It is. However, achieving the vision of Becker and Watts for the discipline for which they had such a passion will require economics departments, and academic economists themselves, to embrace an ethos that values undergraduate education. The question is whether departments are willing to change.

REFERENCES

Abío, G., Alcañiz, M., Gómez-Puig, M., Rubert, G., Serrano, M., Stoyanova, A., & Vilalta-Bufí, M. (2019). Retaking a course in economics: Innovative teaching strategies to improve academic performance in groups of low-performing students. *Innovations in Education and Teaching International*, *56*(2), 206–216.

Ahlstrom, L.J., Asarta, C.J., and Harter, C. (2023, January) *Factors Contributing to the Use of Diversity, Inclusion, and Gender Examples in Undergraduate Economics Courses: Findings from the National "Chalk-and-Talk" Survey* [Paper presentation]. Allied Social Science Associations (ASSA) Annual Meeting, 2023, New Orleans, LA.

Ahlstrom, L. J., & Asarta, C. J. (2019). The gender gap in undergraduate economics course persistence and degree selection. *AEA Papers and Proceedings*, *109*, 255–260. https://doi.org/10.1257/pandp.20191103

Akerlof, G. A. (2020). Sins of omission and the practice of economics. *Journal of Economic Literature*, *58*(2), 405–418. https://doi.org/10.1257/jel.20191573

Algan, Y., Cahuc, P., & Shleifer, A. (2013). Teaching practices and social capital. *American Economic Journal: Applied Economics*, *5*(3), 189–210. https://doi.org/10.1257/app.5.3.189

Allgood, S., Bosshardt, W., Klaauw, W. van der, & Watts. Michael. (2004). What students remember and say about college economics years later. *American Economic Review*, *94*(2).

Allgood, S., Bosshardt, W., Van Der Klaauw, W., & Watts, M. (2011). Economics coursework and long-term behavior and experiences of college graduates in labor markets and personal finance. *Economic Inquiry*, *49*(3), 771–794. https://doi.org/10.1111/j.1465-7295.2009.00270.x

Allgood, S., Bosshardt, W., van der Klaauw, W., & Watts, M. (2012). Is economics coursework, or majoring in economics, associated with different civic behaviors? *The Journal of Economic Education*, *43*(3), 248–268.

Allgood, S., Hoyt, G., & McGoldrick, K. (2018). Teacher training for Ph.D. students and new faculty in economics. *Journal of Economic Education*, *49*(2), 209–219. Education Source.

Allgood, S., & Walstad, W. B. (1999). The longitudinal effects of economic education on teachers and their students. *The Journal of Economic Education*, *30*(2), 99–111.

Allgood, S., & Walstad, W. B. (2013). How economists allocate time to teaching and research. *American Economic Review*, *103*(3), 654–658. https://doi.org/10.1257/aer.103.3.654

Allgood, S., Walstad, W. B., & Siegfried, J. J. (2015). Research on teaching economics to undergraduates. *Journal of Economic Literature*, *53*(2), 285–325.

Anderson, K. H., & Siegfried, J. J. (1997). Gender differences in rating the teaching of economics. *Eastern Economic Journal*, *23*(3), 347–357.

Anderson, M. 1936-2015 & Hoover Institution Press. (1996). *Impostors in the temple: A blueprint for improving higher education in America*. Hoover Institution Press; http://catdir.loc.gov/catdir/enhancements/fy1315/96022679-b.html

Antecol, H., Bedard, K., & Stearns, J. (2018). Equal but inequitable: Who benefits from gender-neutral tenure clock stopping policies? *The American Economic Review*, *108*(9), 2420–2441.

Asar, Y., & Kılınç, K. (2020). A jackknifed ridge estimator in probit regression model. *Statistics*, *54*(4), 667–685. https://doi.org/10.1080/02331888.2020.1775597

Asarta, C. J., Bento, R., Fornaciari, C. J., Lund Dean, K., Arbaugh, J. B., & Hwang, A. (2018). The scholarship of teaching and learning: changing the dominant narrative about (and in) research institutions. *Journal of Management Education*, *42*(6), 731–748.

Asarta, C. J., Chambers, R. G., & Harter, C. (2021). Teaching methods in undergraduate introductory economics courses: Results from a sixth national quinquennial survey. *The American Economist*, *66*(1), 18–28. https://doi.org/10.1177/0569434520974658

Asarta, C. J., Fuess, S. M. Jr., & Perumal, A. (2013). How do transfer students perform in economics? Evidence from intermediate macroeconomics. *The Journal of Economic Education*, *44*(2), 110–128. https://doi.org/10.1080/00220485.2013.770336

Asarta, C. J., & Schmidt, J. R. (2017). Comparing student performance in blended and traditional courses: Does prior academic achievement matter? *The Internet and Higher Education*, *32*, 29–38. https://doi.org/10.1016/j.iheduc.2016.08.002

Ashworth, J., & Evans, L. (1999). Lack of knowledge deters women from studying Economics. *Educational Research*, *41*(2), 209–227.

Auriol, E., Friebel, G., Weinberger, A., & Wilhelm, S. (2022). Underrepresentation of women in the economics profession more pronounced in the United States compared to heterogeneous Europe. *Proceedings of the National Academy of Sciences*, *119*(16). https://doi.org/10.1073/pnas.2118853119

Babcock, P. (2010). Real costs of nominal grade inflation? New evidence from student course evaluations. *Economic Inquiry*, *48*(4), 983–996.

Balli, H. O., & Sørensen, B. E. (2013). Interaction effects in econometrics. *Empirical Economics : Journal of the Institute for Advanced Studies, Vienna, Austria*, *45*(1), 583–603. https://doi.org/10.1007/s00181-012-0604-2

Bansak, C., & Starr, M. (2010). Gender differences in predispositions towards economics. *Eastern Economic Journal.*, *48*(1), 33.

Bayer, A., Hoover, G., & Washington, E. (2020). How you can work to increase the presence and improve the experience of black, latinx, and native american people in the economics profession. *Journal of Economic Perspectives*, *34*(3), 193–219. https://doi.org/10.1257/jep.34.3.193

Bayer, A., & Rouse, C. (2016). Diversity in the economics profession: A new attack on an old problem. *Journal of Economic Perspectives*, *30*(4), 221–242.

Becker, G. S. (1996). *Accounting for tastes*. Harvard University Press; http://digitool.hbz-nrw.de:1801/webclient/DeliveryManager?pid=811010&custom_att_2=simple_viewer

Becker, G. S., & Mulligan, C. B. (1997). The endogenous determination of time preference. *Quarterly Journal of Economics*, *112*(3), 729(30).

Becker, W. E. (1979). Professorial behavior given a stochastic reward structure. *The American Economic Review*, *69*(5), 1010–1017. JSTOR.

Becker, W. E. (1997). Teaching economics to undergraduates. *Journal of Economic Literature*, *35*(3), 1347–1373.

Becker, W. E., & Kennedy, P. E. (2005). Does teaching enhance research in economics? *AMERICAN ECONOMIC REVIEW*, *95*(2), 172–176.

Becker, W. E., & Watts, M. (1995). Teaching tools: Teaching methods in undergraduate economics. *Economic Inquiry*, *33*(4), 692–700. https://doi.org/10.1111/j.1465-7295.1995.tb01889.x

Becker, W. E., & Watts, M. (1996). Chalk and talk: A national survey on teaching undergraduate economics. *American Economic Review*, *86*(2), 448(6).

Becker, W. E., & Watts, M. (2001). Teaching economics at the start of the 21st century: Still chalk and talk. *American Economic Review*, *91*(2), 446–451. https://doi.org/10.1257/aer.91.2.446

Beichner, R. J., Saul, J. M., Abbott, D. S., Morse, J. J., Allain, R. J., Bonham, S. W., Dancy, M. H., & Risley, J. S. (n.d.). *The Student-Centered Activities for Large Enrollment Undergraduate Programs (SCALE-UP) Project*. 42.

Bentley, P. J., & Kyvik, S. (2013). Individual differences in faculty research time allocations across 13 countries. *Research in Higher Education*, *54*(3), 329–348. https://doi.org/10.1007/s11162-012-9273-4

Bhui, R. (2019). A statistical test for the optimality of deliberative time allocation. *Psychonomic Bulletin & Review*, *26*(3), 855–867. https://doi.org/10.3758/s13423-018-1555-1

Bodary, P. F., & Gross, M. M. (2018). Innovative teaching and learning strategies in kinesiology. *Kinesiology Review*, *7*(4), 321–327. https://doi.org/10.1123/kr.2018-0037

Boex, L. F. J. (2000). Identifying the attributes of effective economics instructors: An analysis of student evaluations. *Journal of Economic Education*, *31*(3), 211–227.

Boring, A. (2017). Gender biases in student evaluations of teaching. *Journal of Public Economics*, *145*, 27–41. https://doi.org/10.1016/j.jpubeco.2016.11.006

Bosshardt, W., & Watts, M. (2001). Comparing student and instructor evaluations of teaching. *The Journal of Economic Education*, *32*(1), 3–17.

Boyer Commission on Educating Undergraduates in the Research University. (n.d.). *Reinventing undergraduate education: A blueprint for America 's research universities*.

Boyle, P., & Boice, B. (1998). Systematic mentoring for new faculty teachers and graduate teaching assistants. *Innovative Higher Education*, *22*(3), 157–179.

Breen, R., & García-Peñalosa, C. (2002). Bayesian learning and gender segregation. *Journal of Labor Economics*, *20*(4), 899–922.

Buckles, S., & Siegfried, J. J. (2006). Using multiple-choice questions to evaluate in-depth learning of economics. *The Journal of Economic Education*, *37*(1), 48–57.

Buser, W., Batz-Barbarich, C. L., & Hayter, J. K. (2022). Evaluation of women in economics: Evidence of gender bias following behavioral role violations. *Sex Roles*, *86*(11), 695–710. https://doi.org/10.1007/s11199-022-01299-w

Butters, R., Asarta, C., & Thompson, E. (2013). The production of economic knowledge in urban and rural areas: The role of student, teacher, and school characteristics. *Journal of Agricultural and Applied Economics*, *45*(1), 1–15. https://doi.org/10.1017/S1074070800004545

Cameron, A. C. (Adrian C., & Trivedi, P. K. (2010). *Microeconometrics using Stata* (Revised edition.). Stata Press; http://books.google.com/books?isbn=9781597180733

Carter, L. K., & Emerson, T. L. N. (2012). In-class vs. Online experiments: Is there a difference? *The Journal of Economic Education*, *43*(1), 4–18. https://doi.org/10.1080/00220485.2011.636699

Cartwright, E., & Stepanova, A. (2012). What do students learn from a classroom experiment: Not much, unless they write a report on it. *The Journal of Economic Education*, *43*(1), 48–57. https://doi.org/10.1080/00220485.2012.636710

Caviglia-Harris, J. (2016). Flipping the undergraduate economics classroom: Using online videos to enhance teaching and learning. *Southern Economic Journal*, *83*(1), 321–331. https://doi.org/10.1002/soej.12128

Ceci, S. J., Ginther, D. K., Kahn, S., & Williams, W. M. (2014). Women in academic science: A changing landscape. *Psychological Science in the Public Interest*, *15*(3), 75–141. https://doi.org/10.1177/1529100614541236

Chan, N., & Kennedy, P. E. (2002). Are multiple-choice exams easier for economics students? A comparison of multiple-choice and "equivalent" constructed-response exam questions. *Southern Economic Journal*, *68*(4), 957–971.

Chevalier, J. (2022). Report: Committee on the Status of Women in the Economics Profession (CSWEP). *AEA Papers and Proceedings*, *112*, 746–767. https://doi.org/10.1257/pandp.112.746

Chizmar, J. F., & Ostrosky, A. L. (1998). The one-minute paper: Some empirical findings. *The Journal of Economic Education*, *29*(1), 3–10.

Claire Crawford, Davies, N. M., & Smith, S. (2018). Why do so few women study economics? Evidence from England. *Royal Economic Society*. https://www.res.org.uk/resources-page/why-do-so-few-women-study-economics--2018-pdf.html

Cooper, K. M., Downing, V. R., & Brownell, S. E. (2018). The influence of active learning practices on student anxiety in large-enrollment college science classrooms. *International Journal of STEM Education*, *5*(1), 23. https://doi.org/10.1186/s40594-018-0123-6

Croson, R., & Gneezy, U. (2009). Gender differences in preferences. *Journal of Economic Literature*, *47*(2), 448–474.

Curtis, J. W. (2005). Inequities persist for women and non-tenure-track faculty: Economic status of the profession, 2004-05. *Academe*, *91*(2), 19–98.

Datta Gupta, N., Poulsen, A., & Villeval, M. C. (2013). Gender matching and competitiveness: Experimental evidence. *Economic Inquiry*, *51*(1), 816–835. https://doi.org/10.1111/j.1465-7295.2011.00378.x

DellaVigna, S. (2009). Psychology and economics: Evidence from the field. *Journal of Economic Literature*, *47*(2), 315–372.

DeNeve, K. M., & Heppner, M. J. (1997). Role play simulations: The assessment of an active learning technique and comparisons with traditional lectures. *Innovative Higher Education*, *21*(3), 231–246. https://doi.org/10.1007/BF01243718

Dickens, C. S., & Sagaria, M. A. D. (1997). Feminists at work: Collaborative relationships among women faculty. *Review of Higher Education*, *21*(1), 79–101.

Dickie, M. (2007). Do classroom experiments increase learning in introductory microeconomics? *Journal of Economic Education*, *37*(3), 267–288.

Dupas, P., Modestino, A. S., Niederle, M., & Wolfers, J. (2021). Gender and the dynamics of economics seminars. *Working Paper Series.*, *28494*, ALL-ALL.

Emerson, T. L. N., McGoldrick, K., & Mumford, K. J. (2012). Women and the choice to study economics. *The Journal of Economic Education*, *43*(4), 349–362.

Emerson, T. L. N., McGoldrick, K., & Siegfried, J. J. (2018). The gender gap in economics degrees: An investigation of the role model and quantitative requirements hypotheses. *Southern Economic Journal*, *84*(3), 898–911. https://doi.org/10.1002/soej.12247

Emerson, T. L. N., & Taylor, B. A. (2004). Comparing student achievement across experimental and lecture-oriented sections of a principles of microeconomics course. *Southern Economic Journal*, *70*(3), 672–693.

Evans, B. A., Grimes, P. W., & Becker, W. E. (2012). What led eminent economists to become economists? *The Journal of Economic Education*, *43*(1), 83–98.

Ewald, J. D. (2010). "Do you know where X is?": Direction-giving and male/female direction-givers. *Journal of Pragmatics*, *42*(9), 2549–2561. https://doi.org/10.1016/j.pragma.2010.02.011

Feiner, S., & Roberts, B. (1995). Using alternative paradigms to teach about race and gender: A critical thinking approach to introductory economics. *The American Economic Review*, *85*(2), 367–371.

Feigenbaum, Susan K. 2013. "Attracting More Women and Minorities into Economics." Newsletter of the Committee on the Status of Women in the Economics Profession, Summer. https://www.aeaweb.org/content/!le?id=570.

Finkelstein, M. J. 1949-. (1984). *The American academic profession: A synthesis of social scientific inquiry since World War II*. Ohio State University Press; https://bac-lac.on.worldcat.org/oclc/468353842

Forest, J. J. F. (2002). *I Prefer to Teach: An International Comparison of Faculty Preference for Teaching over Research. Studies in Higher Education Dissertation Series.* Routledge Customer Service;

Frank, B. (1997). The impact of classroom experiments on the learning of economics: An empirical investigation. *Economic Inquiry*, *35*(4), 763–769. https://doi.org/10.1111/j.1465-7295.1997.tb01962.x

Frank, R. H., Gilovich, T. D., & Regan, D. T. (1993). Does studying economics inhibit cooperation? *Journal of Economic Perspectives*, *7*, 159–171. https://doi.org/10.1257/jep.7.2.159

Frank, R. H., Gilovich, T. D., & Regan, D. T. (1996). Do economists make bad citizens? *Journal of Economic Perspectives*, *10*(1), 187(6).

Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014a). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(23), 8410–8415.

Gautier, A., & Wauthy, X. (2007). Teaching versus research: A multi-tasking approach to multi-department universities. *European Economic Review*, *51*(2), 273–295. https://doi.org/10.1016/j.euroecorev.2006.02.006

Ginther, D. K., & Kahn, S. (2021). Women in economics: Have we made progress? *Working Paper Series.*, *28743*, ALL-ALL.

Goffe, W. L., & Kauper, D. (2014). A survey of principles instructors: Why lecture prevails. *The Journal of Economic Education*, *45*(4), 360–375. https://doi.org/10.1080/00220485.2014.946547

Goldin, C., Guerrieri, V., & Voena, A. (2019, May 29). Why are there so few women economists? *Chicago Booth Review*.

https://review.chicagobooth.edu/economics/2019/article/why-are-there-so-few-women-economists

Gottlieb, E. E., & Keith, B. (1997). The academic research-teaching nexus in eight advanced-industrialized countries. *Higher Education*, *34*(3), 397–419. https://doi.org/10.1023/A:1003028023964

Haak, D. C., HilleRisLambers, J., Pitre, E., & Freeman, S. (2011). Increased structure and active learning reduce the achievement gap in introductory biology. *Science*, *332*(6034), 1213–1216.

Hake, R. R. (1998). Interactive-engagement versus traditional methods: A six-thousand-student survey of mechanics test data for introductory physics courses. *American Journal of Physics*, *66*(1), 64(11).

Halmos, P. R., Moise, E. E., & Piranian, G. (1975). The problem of learning to teach. *The American Mathematical Monthly*, *82*(5), 466–476.

Hamermesh, D. S. (2005). An old male economists advice to young female economists. *CSWEP Newsletter*, 11–12.

Harford, J. (2018). The perspectives of women professors on the professoriate: A missing piece in the narrative on gender equality in the university. *Education Sciences*, *8*(2). https://doi.org/10.3390/educsci8020050

Harter, C., & Asarta, C. J. (2022). Teaching methods in undergraduate intermediate theory, statistics and econometrics, and other upper-division economics courses: Results from a sixth national quinquennial survey. *The American Economist*, 056943452110379. https://doi.org/10.1177/05694345211037904

Harter, C., Chambers, R. G., & Asarta, C. J. (2022). Assessing learning in college economics: A sixth national quinquennial survey. *Eastern Economic Journal*. https://doi.org/10.1057/s41302-021-00205-8

Harter, C. L., Becker, W. E., & Watts, M. (1999). Who teaches with more than chalk and talk? *Eastern Economic Journal*, *25*(3), 343–356.

Harter, C. L., Becker, W. E., & Watts, M. (2011). Time allocations and reward structures for us academic economists from 1995–2005: Evidence from three national surveys. *International Review of Economics Education*, *10*(2), 6–27. https://doi.org/10.1016/S1477-3880(15)30031-1

Harter, C. L., Schaur, G., & Watts, M. (2015). What do teaching weights tell us? *The Journal of Economic Education*, *46*(3), 310–323. https://doi.org/10.1080/00220485.2015.1040183

Harter, C., Schaur, G., & Watts, M. (2015). School, department, and instructor determinants of teaching methods in undergraduate economics courses. *Southern Economic Journal*, *81*(4), 1169–1188. https://doi.org/10.4284/0038-4038-2013.266

Hiebert, J., Stigler, J. W., Jacobs, J. K., Givvin, K. B., Garnier, H., Smith, M., Hollingsworth, H., Manaster, A., Wearne, D., & Gallimore, R. (2005). Mathematics teaching in the united states today (and tomorrow): Results from the timss 1999 video study. *Educational Evaluation and Policy Analysis*, *27*(2), 111–132.

Hoyt, G. M. (2003). How to make economics the fulfilling social science. *Southern Economic Journal*, *70*(1), 201–206.

Ingleton, C. (1997). Factors contributing to lower participation of women in the study of economics in Australia: An exploratory study. *Australian Economic Papers*, *36 SPI*, 46–55.

Islam, Md. S., & Alam, K. (2018). Does social capital reduce poverty? A cross-sectional study of rural household in Bangladesh. *International Journal of Social Economics*, *45*(11), 1515–1532. https://doi.org/10.1108/IJSE-07-2017-0295

Jensen, E. J., & Owen, A. L. (2001). Research in economic education—Pedagogy, gender, and interest in economics. *The Journal of Economic Education.*, *32*(4), 323.

Johnson, D. W., Johnson, R. T., & Smith, K. A. (1998). Cooperative learning returns to college: What evidence is there that it works? *Change*, *30*(4), 26–35.

Johnston, C. G., James, R. H., Lye, J. N., & McDonald, I. M. (2000). An evaluation of the introduction of collaborative problem solving for learning economics. *Journal of Economic Education*, *31*(1), 13–29.

Jones, S., Hoest, E., Fuld, R., Mahesh, D., & Colander, D. (2009). *Educating economists: The Teagle discussion on re-evaluating the undergraduate economics major*. Edward Elgar;

Jones, T. & Sloan, A. (2022) the academic origins of economics faculty. IZA Discussion Paper No. 14965, Available at SSRN: https://ssrn.com/abstract=4114490 or http://dx.doi.org/10.2139/ssrn.4114490

Joseph, M. L. (1970). Game and simulation experiments. *The Journal of Economic Education*, *1*(2), 91–96.

Keng, S. H. (2020). Gender bias and statistical discrimination against female instructors in student evaluations of teaching. *Labour Economics*, *66*. https://doi.org/10.1016/j.labeco.2020.101889

Kessler, S. R., Spector, P. E., & Gavin, M. B. (2014). A critical look at ourselves: Do male and female professors respond the same to environment characteristics? *Research in Higher Education : Journal of the Association for Institutional Research*, *55*(4), 351–369. https://doi.org/10.1007/s11162-013-9314-7

Kezar, A. J., & Kinzie, J. L. (2006). Examining the ways institutions create student engagement: The role of mission. *Journal of College Student Development*, *47*(2), 149–172.

Kosar, R., & Scott, D. W. (2018). Examining the carnegie classification methodology for research universities. *Statistics and Public Policy*, *5*(1), 1–12. https://doi.org/10.1080/2330443X.2018.1442271

Kristof-Brown, A. L., Zimmerman, R. D., & Johnson, E. C. (2005). Consequences of individuals' fit at work: A meta-analysis of person-job, person-organization, person-group, and person-supervisor fit. *Personnel Psychology*, *58*(2), 281–342. https://doi.org/10.1111/j.1744-6570.2005.00672.x

Kuh, G. D., & Hu, S. (2001). Learning productivity at research universities. *The Journal of Higher Education*, *72*(1), 1–28.

Kuhn, P., & Villeval, M. C. (2015). Are women more attracted to cooperation than men? *The Economic Journal*, *125*(582), 115–140.

Lage, M. J., Platt, G. J., & Treglia, M. (2000). Inverting the classroom: A gateway to creating an inclusive learning environment. *The Journal of Economic Education*, *31*(1), 30–43.

Laursen, S., & Austin, A. E. (2020). *Building gender equity in the academy: Institutional strategies for change* (Vol. 1–1 online resource). Johns Hopkins University Press; https://muse.jhu.edu/book/78724/

Link, A. N., Swann, C. A., & Bozeman, B. (2008). A time allocation study of university faculty. *Economics of Education Review*, *27*(4), 363–374. https://doi.org/10.1016/j.econedurev.2007.04.002

Lombardi, W., Ramrattan, L. B., & Szenberg, M. (2004). Anomalies in economics enrollment: 1991-1992 to 1995-1996. *Economics of Education Review*, *23*(2), 153–165. https://doi.org/10.1016/j.econedurev.2003.06.001

Lundberg, S., & Stearns, J. (2019). Women in economics: Stalled progress. *Journal of Economic Perspectives*, *33*(1), 3–22. https://doi.org/10.1257/jep.33.1.3

Maier, M. H., & Keenan, D. (1994). Teaching tools: Cooperative learning in economics. *Economic Inquiry*, *32*(2), 358–361. https://doi.org/10.1111/j.1465-7295.1994.tb01335.x

Main, J. B., & Ost, B. (2014). The impact of letter grades on student effort, course selection, and major choice: A regression-discontinuity analysis. *The Journal of Economic Education*, *45*(1), 1–10. https://doi.org/10.1080/00220485.2014.859953

Malgwi, C. A., Howe, M. A., & Burnaby, P. A. (2005). Influences on students' choice of college major. *Journal of Education for Business*, *80*(5), 275–282.

Marburger, D. R. (2005). Comparing student performance using cooperative learning. *International Review of Economics Education*, *4*(1), 46–57. https://doi.org/10.1016/S1477-3880(15)30138-9

Marsh, H. W., & Hattie, J. (2002). The relation between research productivity and teaching effectiveness: Complementary, antagonistic, or independent constructs. *Journal of Higher Education*, *73*(5), 603–641.

Marton, F., & Säljö, R. (1976). On qualitative differences in learning: Outcome and process. *British Journal of Educational Psychology*, *46*(1), 4–11. https://doi.org/10.1111/j.2044-8279.1976.tb02980.x

McCann, M. (2017). Constructive alignment in economics teaching: A reflection on effective implementation. *Teaching in Higher Education*, *22*(3), 336–348.

McCormick, A. C. (2013). Classifying higher education institutions: Lessons from the Carnegie Classification. *Pensamiento Educativo. Revista de Investigación: Educacional Latinoamericana*, *50*, 65-75.

McCormick, A. C., Gonyea, R. M., & Kinzie, J. (2013). Refreshing engagement: NSSE at 13. *Change: The Magazine of Higher Learning*, *45*(3), 6–15.

McCormick, A. C., Pike, G. R., Kuh, G. D., & Chen, P.-S. D. (2009). Comparing the utility of the 2000 and 2005 carnegie classification systems in research on students' college experiences and outcomes. *Research in Higher Education*, *50*(2), 144–167.

McCormick, A., & Zhao, C. M. (2005). Rethinking and reframing the Carnegie Classification. *Change: The Magazine of Higher Learning*, *37*(5), 51–57.

McGoldrick, K., Hoyt, G., & Colander, D. (2010). The professional development of graduate students for teaching activities: The students' perspective. *The Journal of Economic Education*, *41*(2), 194–201.

McKeachie, W. J. (1990). Research on College Teaching: The Historical Background. *Journal of Educational Psychology*, *82*(2), 189–200.

McMillin, W. D. (2003). Is the economics major dying and, if so, will changes in teaching technology and course content save it? *Southern Economic Journal*, *70*(1), 206–209.

McMurtrie, B. (2014). The difference mentoring makes. *The Chronicle of Higher Education*, *60*(42), NA.

Melicher, R. W. (2000). The perceived value of research and teaching mentoring by finance academicians. *Financial Practice and Education*, *10*(1), 166–174.

Moore, R. L. (1998). Teaching introductory economics with a collaborative learning lab component. *Journal of Economic Education*, *29*(4), 321–329.

Mumford, K. J., & Ohland, M. W. (2011). Student performance in undergraduate economics courses. *The Journal of Economic Education*, *42*(3), 275–282.

National Center for Education Statistics. (n.d.). *Undergraduate Degree Fields*. Retrieved October 11, 2021, from (https://nces.ed.gov/programs/coe/indicator/cta)

Nguyen, Q. (2011). Does nurture matter: Theory and experimental investigation on the effect of working environment on risk and time preferences. *Journal of Risk and Uncertainty*, *43*(3), 245–270. https://doi.org/10.1007/s11166-011-9130-4

Niederle, M., & Vesterlund, L. (2010). Explaining the gender gap in math test scores: The role of competition. *Journal of Economic Perspectives*, *24*(2), 129–144. https://doi.org/10.1257/jep.24.2.129

Niederle, M., & Yestrumskas, A. H. (2008). Gender differences in seeking challenges: The role of institutions, working paper 13922. *Working Paper Series.*, *13922*, ALL.

Palali, A., van Elk, R., Bolhaar, J., & Rud, I. (2018). Are good researchers also good teachers? The relationship between research quality and teaching quality. *Economics of Education Review*, *64*, 40–49. https://doi.org/10.1016/j.econedurev.2018.03.011

Pike, G. R., Smart, J. C., Kuh, G. D., & Hayek, J. C. (2006). Educational expenditures and student engagement: When does money matter? *Research in Higher Education*, *47*(7), 847–872.

Pike G.R., Kuh G.D., McCormick A.C., Ethington C.A., & Smart J.C. (2011). If and when money matters: The relationships among educational expenditures, student engagement and students' learning outcomes. *Research in Higher Education*, *52*(1), 81–106. https://doi.org/10.1007/s11162-010-9183-2

Pouwels, B., Siegers, J., & Vlasblom, J. D. (2008). Income, working hours, and happiness. *Economics Letters*, *99*(1), 72–74. https://doi.org/10.1016/j.econlet.2007.05.032

Prince, M. (2004). Does active learning work? A review of the research. *Journal of Engineering Education*, *93*(3), 223–231. https://doi.org/10.1002/j.2168-9830.2004.tb00809.x

Rask, K. N., & Bailey, E. M. (2002). Are faculty role models? Evidence from major choice in an undergraduate institution. *Journal of Economic Education*, *33*(2), 99–124.

Rask, K., & Tiefenthaler, J. (2008). The role of grade sensitivity in explaining the gender imbalance in undergraduate economics. *Economics of Education Review*, *27*(6), 676–687. https://doi.org/10.1016/j.econedurev.2007.09.010

Rawn, C. D., & Fox, J. A. (2018). Understanding the work and perceptions of teaching focused faculty in a changing academic landscape. *Research in Higher Education : Journal of the Association for Institutional Research*, *59*(5), 591–622. https://doi.org/10.1007/s11162-017-9479-6

Ray, M. (2018). Teaching economics using 'Cases'—Going beyond the 'Chalk-And-Talk' method. *International Review of Economics Education*, *27*, 1–9. https://doi.org/10.1016/j.iree.2017.12.001

Rebeck, Ken., & Asarta, Carlos. (2012). Methods of assessment in the college economics course. *International Handbook on Teaching and Learning Economics*.

Reverter, A., Martinez, C., Currey, P., van Bommel, S., & Hudson, N. J. (2020). Unravelling student evaluations of courses and teachers. *Cogent Education*, *7*(1), 1771830. https://doi.org/10.1080/2331186X.2020.1771830

Roberts, R. (n.d.). *Jennifer Frey on Education, Philosophy, and the University* (No. 11/1/2021).

Routon, P. W. (2018). Is an economics degree good preparation for the LSAT? *The Journal of Economic Education*, *49*(3), 271–277. https://doi.org/10.1080/00220485.2018.1464985

Sarsons, H. (2017). Recognition for group work: Gender differences in academia. *American Economic Review*, *107*(5), 141–145. https://doi.org/10.1257/aer.p20171126

Saunders, K. T. (2001). Teaching methods and assessment techniques for the undergraduate introductory finance course: A national survey. *JOURNAL OF APPLIED FINANCE*, *11*(Part 1), 110–112.

Schaur, G., Watts, M., & Becker, W. E. (2012). School, department, and instructor determinants of assessment methods in undergraduate economics courses. *Eastern Economic Journal*, *38*(3), 381–400.

Schwartz, S., Kanechewa, S., Rhodes, J., Gowdy, G., Stark, J., Horn, J., Parnes, M., & Spencer, R. (2018). "i'm having a little struggle with this, can you help me out?": Examining impacts and processes of a social capital intervention for first-generation college students. *American Journal of Community Psychology*, *61*(1–2), 166–178. https://doi.org/10.1002/ajcp.12206

Scott, C. E., & Siegfried, J. J. (2021). American Economic Association 2020–2021 Universal Academic Questionnaire Summary Statistics. *AEA Papers and Proceedings*, *111*, 647–649. https://doi.org/10.1257/pandp.111.647

Sheridan, B. J., & Smith, B. (2020). How often does active learning actually occur? Perception versus reality. *AEA Papers and Proceedings*, *110*, 304–308. https://doi.org/10.1257/pandp.20201053

Siegfried, C., & Wuttke, E. (2019). Are multiple-choice items unfair? And if so, for whom? *Citizenship, Social and Economics Education*, *18*(3), 198–217.

Siegfried, J. J. (2006). Does teaching enhance research in economics? A few more thoughts. *Southern Economic Journal*, *72*(3), 760–761.

Siegfried, J. J. (2013). Trends in undergraduate economics degrees, 1991-2012. *The Journal of Economic Education*, *44*(4), 399–405.

Siegfried, J. J. (2021). Trends in undergraduate economics degrees, 2001-2020. *The Journal of Economic Education*, *52*(3), 264–267. https://doi.org/10.1080/00220485.2021.1925191

Siegfried, J. J., & White, K. J. (1973). Financial rewards to research and teaching: A case study of academic economists. *The American Economic Review*, *63*(2), 309–315.

Sierminska, E., & Oaxaca, R. L. (2021). Field specializations among beginning economists: Are there gender differences?. *AEA Papers and Proceedings*, *111*, 86–91. https://doi.org/10.1257/pandp.20211030

Sierra, J. (2020). The importance of simulation in teaching and learning economics: The students' perspective. *Innovations in Education and Teaching International*, *57*(5), 521–531.

Singh, N. (2020). "A little flip goes a long way"—The impact of a flipped classroom design on student performance and engagement in a first-year undergraduate economics classroom. *Education Sciences*, *10*(11), 319. https://doi.org/10.3390/educsci10110319

Stupnisky, R. H., BrckaLorenz, A., & Laird, T. F. N. (2019). How does faculty research motivation type relate to success? A test of self-determination theory. *International Journal of Educational Research*, *98*, 25–35. https://doi.org/10.1016/j.ijer.2019.08.007

Stupnisky, R. H., BrckaLorenz, A., Yuhas, B., & Guay, F. (2018). Faculty members' motivation for teaching and best practices: Testing a model based on self-determination theory across institution types. *Contemporary Educational Psychology*, *53*, 15–26. https://doi.org/10.1016/j.cedpsych.2018.01.004

Stupnisky, R. H., Hall, N. C., Daniels, L. M., & Mensah, E. (2017). Testing a Model of Pretenure Faculty Members' Teaching and Research Success: Motivation as a Mediator of Balance, Expectations, and Collegiality. *The Journal of Higher Education*, *88*(3), 376–400. https://doi.org/10.1080/00221546.2016.1272317

Stupnisky, R. H., Pekrun, R., & Lichtenfeld, S. (2016). New faculty members' emotions: A mixed-method study. *Studies in Higher Education*, *41*(7), 1167–1188. https://doi.org/10.1080/03075079.2014.968546

Taylor, S. W., Fender, B. F., & Burke, K. G. (2006). Unraveling the academic productivity of economists: The opportunity costs of teaching and service. *Southern Economic Journal*, *72*(4), 846–859.

Thoresen, C. J., Kaplan, S. A., Barsky, A. P., Warren, C. R., & de Chermont, K. (2003). The affective underpinnings of job perceptions and attitudes: A meta-analytic review and integration.(Author Abstract). *Psychological Bulletin*, *129*(6), 914(32).

Tidball, M. E. (1976). Of men and research: The dominant themes in American higher education include neither teaching nor women. *The Journal of Higher Education*, *47*(4), 373–389.

Tierney, W. G., & Bensimon, E. Mara. (1996). *Promotion and tenure: Community and socialization in academe*. State University of New York Press;

Toutkoushian, R. K., & Smart, J. C. (2001). Do institutional characteristics affect student gains from college? *The Review of Higher Education*, *25*(1), 39–61. https://doi.org/10.1353/rhe.2001.0017

University of Houston (2015), “University of Houston—Tier One FAQs,” available at *http://www.uh.edu/about/tier-one/tier-one-faq/in dex.php*

University of Nevada Las Vegas (2014), “The path to tier one,” Technical Report, The University of Nevada Las Vegas.

Väisänen, M., & Nätti, J. (2002). Working time preferences in dual-earning households. *European Societies*, *4*(3), 307–329. https://doi.org/10.1080/1461669022000013568 van Praag, B. M. S., Frijters, P., & Ferrer-i-Carbonell, A. (2003). The anatomy of subjective well-being. *Journal of Economic Behavior and Organization*, *51*(1), 29–49. https://doi.org/10.1016/S0167-2681(02)00140-3

Walstad, W. B. (2001). Improving assessment in university economics. *The Journal of Economic Education*, *32*(3), 281–294.

Walstad, W. B. (2006). Testing for depth of understanding in economics using essay questions. *The Journal of Economic Education*, *37*(1), 38–47. https://doi.org/10.3200/JECE.37.1.38-47

Walstad, W. B., & Allgood, S. (2005). Views of teaching and research in economics and other disciplines. *The American Economic Review*, *95*(2), 177–183.

Walstad, W. B., & Becker, W. E. (2010). Preparing graduate students in economics for teaching: Survey findings and recommendations. *The Journal of Economic Education*, *41*(2), 202–210.

Walstad, W. B., & Rebeck, K. (2002). Assessing the economic knowledge and economic opinions of adults. *Quarterly Review of Economics and Finance*, *42*(5), 921–935. https://doi.org/10.1016/S1062-9769(01)00120-X

Walstad, W. B., & Robson, D. (1997). Differential item functioning and male-female differences on multiple-choice tests in economics. *The Journal of Economic Education*, *28*(2), 155–171.

Walstad, W. B., & Salemi, M. K. (2011). Results from a faculty development program in teaching economics. *The Journal of Economic Education*, *42*(3), 283–293.

Watts, M., & Becker, W. E. (2008). A little more than chalk and talk: Results from a third national survey of teaching methods in undergraduate economics courses. *The Journal of Economic Education*, *39*(3), 273–286.

Watts, M., & Schaur, G. (2011). Teaching and Assessment Methods in Undergraduate Economics: A Fourth National Quinquennial Survey. *The Journal of Economic Education*, *42*(3), 294–309. https://doi.org/10.1080/00220485.2011.581956

Webber, K. L. (2019). Does the environment matter? Faculty satisfaction at 4-year colleges and universities in the USA. *Higher Education*, *78*(2), 323–343. https://doi.org/10.1007/s10734-018-0345-z

Webber, K. L., & Rogers, S. M. (2018). Gender differences in faculty member job satisfaction: Equity forestalled? *Research in Higher Education*, *59*(8), 1105–1132. https://doi.org/10.1007/s11162-018-9494-2

White, L. J. (1995). Efforts by departments of economics to assess teaching effectiveness: Results of an informal survey. *The Journal of Economic Education*, *26*(1), 81–85.

Wilkesmann, U., & J. Schmid, C. (2014). Intrinsic and internalized modes of teaching motivation. *Evidence-Based HRM: A Global Forum for Empirical Scholarship*, *2*(1), 6–27. https://doi.org/10.1108/EBHRM-07-2013-0022

Williams R. (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *Stata Journal*, *12*(2), 308–331.

Winters, J. V. (2016). Is economics a good major for future lawyers? Evidence from earnings data. *Journal of Economic Education*, *47*(2), 187–191.

Wood, L., Vu, T., Bower, M., Brown, N., Skalicky, J., Donovan, D., Loch, B., Joshi, N., & Bloom, W. (2011). Professional development for teaching in higher education. *International Journal of Mathematical Education in Science and Technology*, *42*(7), 997–1009.

Wooden, M., Warren, D., & Drago, R. (2009). Working time mismatch and subjective well-being. *British Journal of Industrial Relations*, *47*(1), 147–179. https://doi.org/10.1111/j.1467-8543.2008.00705.x

Wunder, C., & Heineck, G. (2013). Working time preferences, hours mismatch and well-being of couples: are there spillovers? *Labour Economics*, *24*, 244–252. https://doi.org/10.1016/j.labeco.2013.09.002

Yamarik, S. (2007). Does cooperative learning improve student learning outcomes? *The Journal of Economic Education*, *38*(3), 259–277.

Zellers, D. F., Howard, V. M., & Barcic, M. A. (2008). Faculty mentoring programs: Reenvisioning rather than reinventing the wheel. *Review of Educational Research*, *78*(3), 552–588. https://doi.org/10.3102/0034654308320966

Appendices

APPENDIX A

Full Descriptive Statistics

Table A.1 Variable Definitions and Descriptive Statistics, complete

	N	Mean	SD
In-class Presentation Variables			
Lecture Usually or Always = 1 for a response of 5 or 6	1138	0.63	(0.48)
Lecture Usually or Always: 2020 = 1 for a response of 6		0.44	(0.50)
Chalkboard or Whiteboard Text/Graphs		0.84	(0.37)
PowerPoint or Other Computer-Generated Displays		0.83	(0.37)
Overhead Projector Displays/Document Camera		0.39	(0.49)
DVD/VCR Tapes; Films; or Movie/Internet Clips		0.62	(0.49)
Team Teaching		0.17	(0.38)
Guest Lectures		0.46	(0.50)
Discussion Variables			
Discussion: Student(s) with Student(s)	1138	0.77	(0.42)
Discussion: Instructor(s) with Student(s)		0.86	(0.35)
Clickers		0.30	(0.46)
Activities Variables			
Classroom Experiments	1138	0.35	(0.48)
Games & Simulations		0.40	(0.49)
Cooperative Learning/Small-Group Assignments		0.55	(0.50)
Computer Lab Assignments		0.29	(0.45)
Student Self-Assessments of Learning		0.16	(0.36)
Classroom Lessons or Activities that Address Diversity and Inclusion Issues		0.14	(0.35)
Classroom Lessons or Activities that Address Gender Issues		0.13	(0.34)
References to Diversity and Inclusion Issues		0.38	(0.48)
References to Gender Issues		0.39	(0.49)
References to Literature; Drama; or Music Lyrics		0.32	(0.47)
References to Sports		0.35	(0.48)

Table A.1 Variable Definitions and Descriptive Statistics, complete (continued)

Studies of Lives or Work of Nobel Prize or Other Eminent Economists		0.24	(0.43)
Other activities		0.05	(0.22)
Materials Variables			
Textbooks (print)	1138	0.64	(0.48)
Textbooks (online/electronic)		0.56	(0.50)
Publisher-developed Workbooks/Study Guides (print)		0.07	(0.26)
Publisher-developed Online Workbook/Tutorial Assignment		0.25	(0.43)
Adaptive Learning Assignments		0.15	(0.35)
Instructor-developed Class Notes		0.50	(0.50)
Instructor-developed Problem Sets		0.67	(0.47)
Press Readings		0.50	(0.50)
Scholarly Readings		0.53	(0.50)
Other Readings		0.06	(0.24)
Database Variables			
Federal Reserve Economic Data	1138	0.59	(0.49)
Other Government Databases		0.64	(0.48)
Other Databases		0.16	(0.37)
Literature Search Variables			
Library Holdings	1138	0.45	(0.50)
Internet Searches		0.60	(0.49)
EconLit		0.40	(0.49)
Other Lit Searches		0.06	(0.25)
Exams with Multiple-Choice Questions	1138	0.53	(0.50)
Exams with Long-answer Essay/Questions		0.35	(0.48)
Shorter Papers		0.35	(0.48)
Other Written Assignments		0.19	(0.39)
Oral Presentations		0.36	(0.48)
Publisher-developed Online Homework Assignments		0.19	(0.39)
Publisher-developed Adaptive Assignments		0.07	(0.26)
Instructor-developed Online Quizzes and Exams		0.16	(0.37)
Exams with Short-answer Essay/Questions		0.61	(0.49)
Term Papers		0.40	(0.49)

Table A.1 Variable Definitions and Descriptive Statistics, complete (continued)

Homework/Problem Sets		0.60	(0.49)
Class Participation		0.46	(0.50)
Performance in Games; Simulations; or Experiments		0.08	(0.27)
Instructor-developed Online Homework Assignments		0.12	(0.33)
Publisher-developed Online Quizzes and Exams		0.08	(0.26)
Uses groupwork in grade in at least one course		0.48	(0.50)
Other Grading Methods		0.06	(0.24)
Multiple Choice Exams Worth 75% or More of Grade		0.09	(0.28)
Multiple Choice Exams Worth Less than 50% of the Grade		0.70	(0.46)
Group Work Worth 10% or more of Grade		0.43	(0.50)
Mathematical Importance Variables			
Numerical Calculations Extremely Important	1138	0.41	(0.49)
Graphs Extremely Important		0.54	(0.50)
Algebra Extremely Important		0.39	(0.49)
Calculus Extremely Important		0.18	(0.38)
Numerical Calculations Fairly or Extremely Important		0.58	(0.49)
Graphs Fairly or Extremely Important		0.68	(0.47)
Algebra Fairly or Extremely Important		0.57	(0.50)
Calculus Fairly or Extremely Important		0.28	(0.45)
Demographic and Institutional Variables			
Female = 1 for faculty indicating gender as female	871	0.36	(0.48)
Lecturer/Instructor/Adjunct = 1 for faculty with rank of lecturer, instructor, or adjunct	856	0.13	(0.34)
Assistant Professor = 1 for faculty with rank of assistant professor	856	0.24	(0.43)
Associate Professor = 1 for faculty with rank of associate professor	856	0.21	(0.41)
Full Professor = 1 for faculty with rank of full professor or named/endowed chair	878	0.40	(0.49)
English as second language indicator variable = 1 for faculty who do not speak English as a first language	874	0.18	(0.38)

Table A.1 Variable Definitions and Descriptive Statistics, complete (continued)

Doctoral indicator variable = 1 for Doctoral institutions	1138	0.54	(0.50)
Master indicator variable = 1 for Master's institutions	1138	0.22	(0.41)
Baccalaureate indicator variable = 1 for Baccalaureate institutions	1138	0.22	(0.42)
Associate indicator variable = 1 for Associate's institutions	1138	0.02	(0.12)
Proteach: Weight in percentage of teaching on decisions of promotion and tenure	864	33.36	(23.90)
Prorsch: Weight in percentage of research on decisions of promotion and tenure	865	40.41	(28.32)
Annteach: Weight in percentage of teaching on decisions of annual raises	858	23.21	(24.86)
Annrsch: Weight in percentage of research on decisions of annual raises	862	32.36	(39.90)
Wrkteach: Time allocated to teaching	862	50.25	(24.42)
Wrkrsch: Time allocated to research	861	24.24	(20.31)
Wrksrv: Time allocated to service	861	10.85	(10.16)
Dteach: Desired time allocated to teaching	861	44.46	(25.44)
Drsch: Desired time allocated to research	860	34.59	(25.76)
Dsrv: Desired time allocated to service	862	7.71	(8.21)
Experience	832	18.19	(12.72)
Tenure-track teaching load	801	4.82	(1.74)
Class size: Principles	610	93.73	(139.63)
Class size: Intermediate Theory	355	41.57	(51.03)
Class size: Statistics and Econometrics	268	30.28	(18.22)
Class size: Other Upper-Division Courses	663	30.58	(22.94)

APPENDIX B

Full Chapter 4 Tables

Table B.1 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Principles

	Constant		Associate's Institutions		Baccalaureate Institutions		Master's Institutions		R^2
In-Class Presentation Variables: Principles N=734									
Traditional Lectures	0.682**	(0.026)	-0.057	(0.124)	-0.114*	(0.045)	0.019	(0.041)	0.012
Traditional Lectures: 2020 Method	0.465**	(0.027)	0.097	(0.127)	-0.100*	(0.045)	-0.021	(0.044)	0.008
Chalkboard or Whiteboard Text/Graphs	0.832**	(0.021)	0.106	(0.064)	0.157**	(0.022)	0.115**	(0.026)	0.054
PowerPoint or Other Computer-Generated Displays	0.883**	(0.018)	-0.008	(0.085)	-0.006	(0.030)	0.011	(0.028)	0.000
Overhead Projector Displays/Document Camera	0.502**	(0.027)	0.123	(0.124)	-0.237**	(0.043)	-0.043	(0.044)	0.041
DVD/VCR Tapes; Films; or Movie/Internet Clips	0.667**	(0.026)	0.083	(0.112)	0.052	(0.043)	0.072	(0.040)	0.005
Team Teaching	0.132**	(0.019)	0.055	(0.100)	0.003	(0.032)	-0.016	(0.029)	0.001
Guest Lectures	0.303**	(0.025)	-0.116	(0.101)	-0.011	(0.042)	0.006	(0.041)	0.002
Discussion Variables: Principles N=727									
Discussion: Student(s) with Student(s)	0.797**	(0.022)	0.141*	(0.065)	0.119**	(0.030)	0.026	(0.035)	0.018
Discussion: Instructor(s) with Student(s)	0.906**	(0.016)	0.094**	(0.016)	0.077**	(0.019)	0.069**	(0.019)	0.027
Clickers or Other Devices	0.409**	(0.027)	-0.034	(0.124)	-0.139**	(0.043)	-0.094*	(0.042)	0.015
Activities Variables: Principles N=668									
Classroom Experiments	0.435**	(0.029)	-0.185	(0.112)	0.092	(0.048)	-0.000	(0.047)	0.010
Games & Simulations	0.485**	(0.029)	0.077	(0.128)	0.054	(0.048)	0.031	(0.047)	0.002

Table B.1 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Principles (continued)

Cooperative Learning/Small-Group Assignments	0.621**	(0.028)	-0.121	(0.128)	0.151**	(0.043)	0.004	(0.045)	0.021
Computer Lab Assignments	0.133**	(0.020)	0.117	(0.110)	0.113**	(0.039)	0.079*	(0.036)	0.016
Student Self-Assessments of Learning	0.189**	(0.023)	0.061	(0.111)	0.002	(0.038)	0.044	(0.039)	0.003
Classroom Lessons or Activities that Address Diversity and Inclusion Issues	0.150**	(0.021)	0.038	(0.100)	0.054	(0.037)	0.008	(0.034)	0.004
Classroom Lessons or Activities that Address Gender Issues	0.126**	(0.019)	-0.126**	(0.019)	0.059	(0.036)	0.020	(0.032)	0.009
References to Diversity and Inclusion Issues	0.462**	(0.029)	-0.024	(0.128)	0.059	(0.048)	0.000	(0.047)	0.003
References to Gender Issues	0.445**	(0.029)	-0.133	(0.120)	0.124*	(0.048)	0.039	(0.047)	0.013
References to Literature; Drama; or Music Lyrics	0.439**	(0.029)	0.061	(0.129)	-0.031	(0.048)	-0.015	(0.046)	0.001
References to Sports	0.449**	(0.029)	0.239*	(0.120)	-0.047	(0.048)	0.117*	(0.047)	0.020
Studies of Lives or Work of Nobel Prize or Other Eminent Economists	0.289**	(0.026)	-0.039	(0.112)	0.046	(0.045)	-0.006	(0.042)	0.002
Other Activities	0.063**	(0.014)	-0.063**	(0.014)	-0.033	(0.019)	0.002	(0.023)	0.006
Materials Variables: Principles N=669									
Textbooks (print)	0.684**	(0.027)	-0.059	(0.124)	0.101*	(0.042)	0.031	(0.043)	0.009
Textbooks (online/electronic)	0.770**	(0.024)	-0.020	(0.111)	-0.156**	(0.045)	-0.055	(0.041)	0.019
Publisher-developed Workbooks/Study Guides (print)	0.072**	(0.015)	0.115	(0.099)	0.007	(0.026)	0.062*	(0.029)	0.011
Publisher-developed Online Workbook/Tutorial Assignment	0.461**	(0.029)	-0.086	(0.125)	-0.252**	(0.043)	-0.100*	(0.045)	0.043
Adaptive Learning Assignments	0.283**	(0.026)	0.155	(0.127)	-0.154**	(0.037)	-0.095*	(0.039)	0.030
Instructor-developed Class Notes	0.553**	(0.029)	0.072	(0.125)	-0.007	(0.048)	-0.047	(0.047)	0.002
Instructor-developed Problem Sets	0.734**	(0.025)	-0.171	(0.127)	0.131**	(0.037)	-0.067	(0.043)	0.032
Press Readings	0.599**	(0.028)	-0.099	(0.129)	0.101*	(0.046)	0.025	(0.045)	0.009
Scholarly Readings	0.266**	(0.025)	-0.141	(0.087)	0.108*	(0.046)	0.051	(0.043)	0.013
Other Materials	0.053**	(0.013)	0.010	(0.062)	-0.022	(0.019)	0.023	(0.023)	0.005
Database Variables: Principles N=663									
Federal Reserve Databases	0.567**	(0.029)	0.371**	(0.067)	0.176**	(0.045)	0.178**	(0.043)	0.042
Other Government Databases	0.537**	(0.029)	0.401**	(0.067)	0.175**	(0.046)	0.219**	(0.043)	0.052

Table B.1 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Principles (continued)

Other Databases	0.053**	(0.013)	0.197	(0.109)	0.045	(0.027)	0.034	(0.025)	0.015	
Literature Searches of Published and Working Paper Research Variables: Principles N=640										
Library Holdings	0.253**	(0.026)	0.214	(0.132)	0.155**	(0.046)	0.121**	(0.045)	0.023	
Internet	0.412**	(0.029)	0.455**	(0.093)	0.193**	(0.048)	0.123*	(0.048)	0.039	
EconLit	0.187**	(0.023)	0.280*	(0.131)	0.140**	(0.044)	0.106*	(0.042)	0.025	
Other Databases	0.010	(0.006)	-0.010	(0.006)	0.045*	(0.019)	0.024	(0.015)	0.013	
Grading Variables: Principles N=627										
Exams with Multiple-Choice Questions	0.828**	(0.022)	0.109	(0.065)	-0.215**	(0.045)	0.002	(0.036)	0.054	
Exams with Long-answer Essay/Questions	0.161**	(0.022)	0.339**	(0.127)	0.174**	(0.044)	0.084*	(0.040)	0.038	
Shorter Papers	0.172**	(0.022)	0.266*	(0.126)	0.183**	(0.045)	0.080*	(0.040)	0.034	
Other Written Assignments	0.151**	(0.021)	0.162	(0.118)	0.075	(0.040)	0.048	(0.037)	0.009	
Oral Presentations	0.088**	(0.017)	0.162	(0.110)	0.086*	(0.035)	0.099**	(0.034)	0.020	
Publisher-developed Online Homework Assignments	0.365**	(0.029)	0.135	(0.129)	-0.178**	(0.042)	-0.073	(0.045)	0.029	
Publisher-developed Adaptive Assignments	0.140**	(0.021)	0.110	(0.111)	-0.089**	(0.027)	-0.047	(0.030)	0.019	
Instructor-developed Online Quizzes and Exams	0.204**	(0.024)	-0.079	(0.086)	-0.029	(0.039)	0.007	(0.039)	0.002	
Exams with Short-answer Essay/Questions	0.488**	(0.030)	0.137	(0.125)	0.286**	(0.045)	0.144**	(0.047)	0.056	
Term Papers	0.084**	(0.017)	0.166	(0.110)	0.025	(0.030)	0.021	(0.029)	0.008	
Homework/Problem Sets	0.530**	(0.030)	-0.030	(0.129)	0.186**	(0.047)	-0.015	(0.048)	0.028	
Class Participation	0.442**	(0.030)	0.120	(0.128)	0.055	(0.050)	0.043	(0.048)	0.003	
Performance in Games; Simulations; or Experiments	0.077**	(0.016)	0.048	(0.084)	0.007	(0.027)	0.011	(0.027)	0.001	
Instructor-developed Online Homework Assignments	0.133**	(0.020)	0.054	(0.100)	-0.069*	(0.028)	0.042	(0.035)	0.015	
Publisher-developed Online Quizzes and Exams	0.116**	(0.019)	0.259*	(0.123)	-0.071**	(0.025)	-0.016	(0.030)	0.031	
Group Work	0.060**	(0.014)	-0.060**	(0.014)	0.024	(0.026)	-0.025	(0.020)	0.007	
Multiple Choice Exams worth 75% or more of grade	0.193**	(0.023)	-0.130*	(0.065)	-0.154**	(0.028)	-0.018	(0.037)	0.034	

Table B.1 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Principles (continued)

Multiple Choice Exams worth 50% or less of grade	0.474**	(0.030)	0.151	(0.125)	0.346**	(0.043)	0.129**	(0.048)	0.080
Group work worth 10% or more of grade	0.207**	(0.024)	0.230	(0.127)	0.096*	(0.044)	0.097*	(0.043)	0.016
Math Importance Variables: Principles N=623									
Numerical Calculations Extremely Important	0.304**	(0.027)	0.259*	(0.127)	-0.005	(0.046)	-0.045	(0.043)	0.011
Graphs Extremely Important	0.657**	(0.028)	0.155	(0.102)	0.051	(0.046)	-0.034	(0.047)	0.007
Algebra Extremely Important	0.191**	(0.023)	0.059	(0.111)	0.069	(0.042)	0.021	(0.039)	0.005
Calculus Extremely Important	0.014*	(0.007)	-0.014*	(0.007)	0.005	(0.013)	-0.014*	(0.007)	0.005
Numerical Calculations Fairly or Extremely Important	0.537**	(0.030)	0.338**	(0.088)	0.067	(0.049)	-0.031	(0.049)	0.016
Graphs Fairly or Extremely Important	0.880**	(0.019)	0.058	(0.064)	0.036	(0.030)	0.008	(0.031)	0.003
Algebra Fairly or Extremely Important	0.385**	(0.029)	0.115	(0.129)	0.141**	(0.050)	0.009	(0.047)	0.015
Calculus Fairly or Extremely Important	0.021*	(0.009)	0.104	(0.083)	0.011	(0.017)	0.002	(0.014)	0.010

Standard errors in parentheses
* $p < .05$, ** $p < .01$

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics

	Constant		Baccalaureate Institutions		Master's Institutions		R^2
In-Class Presentation Variables: Intermediate N=438							
Traditional Lectures	0.748**	(0.031)	-0.135*	(0.056)	-0.108*	(0.053)	0.017
Traditional Lectures: 2020 Method	0.594**	(0.035)	-0.198**	(0.058)	-0.160**	(0.057)	0.033
Chalkboard or Whiteboard Text/Graphs	0.926**	(0.019)	0.047	(0.024)	0.017	(0.028)	0.007
PowerPoint or Other Computer-Generated Displays	0.802**	(0.028)	0.018	(0.046)	-0.007	(0.046)	0.010
Overhead Projector Displays/Document Camera	0.366**	(0.034)	-0.132*	(0.053)	0.035	(0.056)	0.022
DVD/VCR Tapes; Films; or Movie/Internet Clips	0.436**	(0.035)	0.060	(0.059)	0.089	(0.057)	0.007
Team Teaching	0.054**	(0.016)	0.054	(0.034)	0.019	(0.029)	0.007

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Guest Lectures	0.193**	(0.028)	0.023	(0.048)	0.053	(0.048)	0.003
Discussion Variables: Intermediate N=429							
Discussion: Student(s) with Student(s)	0.712**	(0.032)	0.214**	(0.041)	0.027	(0.052)	0.046
Discussion: Instructor(s) with Student(s)	0.904**	(0.021)	0.068**	(0.026)	0.062*	(0.027)	0.019
Clickers or Other Devices	0.192**	(0.028)	0.010	(0.048)	0.010	(0.046)	0.002
Activities Variables: Intermediate N=379							
Classroom Experiments	0.351**	(0.036)	0.027	(0.061)	-0.004	(0.059)	0.005
Games & Simulations	0.385**	(0.037)	0.044	(0.062)	0.105	(0.062)	0.008
Cooperative Learning/Small-Group Assignments	0.557**	(0.038)	0.228**	(0.056)	0.000	(0.062)	0.042
Computer Lab Assignments	0.109**	(0.024)	0.146**	(0.050)	0.102*	(0.047)	0.030
Student Self-Assessments of Learning	0.149**	(0.027)	0.024	(0.047)	0.072	(0.049)	0.019
Classroom Lessons or Activities that Address Diversity and Inclusion Issues	0.115**	(0.024)	0.038	(0.044)	0.000	(0.040)	0.004
Classroom Lessons or Activities that Address Gender Issues	0.098**	(0.023)	0.035	(0.041)	-0.011	(0.036)	0.004
References to Diversity and Inclusion Issues	0.397**	(0.037)	0.083	(0.063)	-0.002	(0.061)	0.006
References to Gender Issues	0.374**	(0.037)	0.106	(0.063)	0.030	(0.061)	0.013
References to Literature, Drama, or Music Lyrics	0.368**	(0.037)	0.020	(0.062)	0.065	(0.061)	0.006
References to Sports	0.391**	(0.037)	-0.023	(0.061)	0.119	(0.062)	0.014
Studies of Lives or Work of Nobel Prize or Other Eminent Economists	0.287**	(0.034)	0.039	(0.059)	0.030	(0.057)	0.005
Other Activities	0.052**	(0.017)	-0.011	(0.026)	0.016	(0.030)	0.002
Materials Variables: Intermediate N=389							
Textbooks (print)	0.790**	(0.030)	0.047	(0.048)	0.051	(0.047)	0.006
Textbooks (online/electronic)	0.575**	(0.037)	-0.034	(0.063)	-0.014	(0.061)	0.002
Publisher-developed Workbooks/Study Guides (print)	0.066**	(0.019)	0.015	(0.033)	0.037	(0.035)	0.010

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Publisher-developed Online Workbook/Tutorial Assignment	0.215**	(0.031)	-0.113**	(0.043)	0.037	(0.052)	0.022
Adaptive Learning Assignments	0.083**	(0.021)	-0.032	(0.030)	-0.017	(0.032)	0.042
Instructor-developed Class Notes	0.619**	(0.036)	-0.017	(0.062)	-0.086	(0.061)	0.006
Instructor-developed Problem Sets	0.884**	(0.024)	0.024	(0.038)	-0.174**	(0.050)	0.052
Press Readings	0.552**	(0.037)	0.152*	(0.059)	-0.029	(0.061)	0.023
Scholarly Readings	0.414**	(0.037)	0.218**	(0.061)	0.053	(0.061)	0.032
Other Materials	0.039**	(0.014)	0.012	(0.027)	0.017	(0.027)	0.002
Database Variables: Intermediate N=388							
Federal Reserve Databases	0.514**	(0.037)	0.167**	(0.060)	0.103	(0.060)	0.026
Other Government Databases	0.475**	(0.037)	0.185**	(0.061)	0.151*	(0.060)	0.035
Other Databases	0.094**	(0.022)	-0.001	(0.037)	-0.019	(0.034)	0.031
Literature Searches of Published and Working Paper Research Variables: Intermediate N=375							
Library Holdings	0.282**	(0.034)	0.104	(0.061)	0.101	(0.059)	0.012
Internet	0.460**	(0.038)	0.186**	(0.062)	0.070	(0.063)	0.024
EconLit	0.207**	(0.031)	0.272**	(0.060)	0.097	(0.055)	0.062
Other Databases	0.034*	(0.014)	0.007	(0.025)	0.005	(0.024)	0.001
Grading Variables: Intermediate N=366							
Exams with Multiple-Choice Questions	0.411**	(0.038)	0.042	(0.064)	0.149*	(0.063)	0.025
Exams with Long-answer Essay/Questions	0.423**	(0.038)	0.041	(0.064)	-0.043	(0.062)	0.015
Shorter Papers	0.125**	(0.026)	0.201**	(0.055)	0.065	(0.047)	0.053
Other Written Assignments	0.089**	(0.022)	0.100*	(0.046)	0.081	(0.044)	0.019
Oral Presentations	0.101**	(0.023)	0.130**	(0.049)	0.079	(0.045)	0.024
Publisher-developed Online Homework Assignments	0.113**	(0.025)	-0.071*	(0.032)	0.027	(0.043)	0.020
Publisher-developed Adaptive Assignments	0.042**	(0.016)	-0.031	(0.019)	-0.012	(0.023)	0.006

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Instructor-developed Online Quizzes and Exams	0.077**	(0.021)	0.038	(0.039)	0.013	(0.035)	0.004
Exams with Short-answer Essay/Questions	0.714**	(0.035)	0.044	(0.056)	-0.034	(0.059)	0.004
Term Papers	0.119**	(0.025)	0.039	(0.045)	0.041	(0.045)	0.006
Homework/Problem Sets	0.762**	(0.033)	0.038	(0.053)	-0.092	(0.058)	0.020
Class Participation	0.351**	(0.037)	0.112	(0.063)	0.089	(0.062)	0.013
Performance in Games; Simulations; or Experiments	0.030*	(0.013)	0.023	(0.027)	0.040	(0.029)	0.007
Instructor-developed Online Homework Assignments	0.060**	(0.018)	0.004	(0.031)	0.030	(0.034)	0.011
Publisher-developed Online Quizzes and Exams	0.036*	(0.014)	-0.025	(0.018)	0.024	(0.028)	0.010
Group Work	0.030*	(0.013)	0.065*	(0.033)	0.020	(0.026)	0.015
Group work worth 10% or more of grade	0.268**	(0.034)	0.174**	(0.062)	0.042	(0.058)	0.028
Multiple Choice Exams worth 75% or more of grade	0.048**	(0.017)	-0.037	(0.020)	0.012	(0.029)	0.010
Multiple Choice Exams worth 50% or less of grade	0.857**	(0.027)	0.080*	(0.037)	-0.007	(0.045)	0.015
Math Importance Variables: Intermediate N=364							
Numerical Calculations Extremely Important	0.494**	(0.039)	-0.010	(0.065)	-0.019	(0.064)	0.006
Graphs Extremely Important	0.690**	(0.036)	0.046	(0.058)	0.047	(0.057)	0.005
Algebra Extremely Important	0.601**	(0.038)	0.083	(0.061)	-0.066	(0.063)	0.013
Calculus Extremely Important	0.321**	(0.036)	0.047	(0.062)	-0.130*	(0.054)	0.024
Numerical Calculations Fairly or Extremely Important	0.732**	(0.034)	-0.048	(0.059)	0.005	(0.056)	0.005
Graphs Fairly or Extremely Important	0.833**	(0.029)	0.114**	(0.037)	0.096*	(0.039)	0.029
Algebra Fairly or Extremely Important	0.857**	(0.027)	0.017	(0.044)	-0.079	(0.050)	0.012
Calculus Fairly or Extremely Important	0.542**	(0.039)	-0.047	(0.064)	-0.229**	(0.061)	0.042

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

In-Class Presentation Variables: Statistics and Econometrics N=330							
Traditional Lectures	0.667**	(0.037)	-0.140*	(0.064)	0.014	(0.066)	0.018
Traditional Lectures: 2020 Method	0.455**	(0.039)	-0.196**	(0.060)	-0.010	(0.071)	0.032
Chalkboard or Whiteboard Text/Graphs	0.915**	(0.022)	0.085**	(0.022)	-0.012	(0.041)	0.027
PowerPoint or Other Computer-Generated Displays	0.848**	(0.028)	0.001	(0.047)	-0.015	(0.052)	0.000
Overhead Projector Displays/Document Camera	0.424**	(0.039)	-0.155*	(0.060)	0.006	(0.070)	0.021
DVD/VCR Tapes; Films; or Movie/Internet Clips	0.315**	(0.036)	0.007	(0.061)	0.115	(0.069)	0.010
Team Teaching	0.109**	(0.024)	0.052	(0.045)	-0.040	(0.039)	0.011
Guest Lectures	0.255**	(0.034)	-0.039	(0.055)	-0.088	(0.056)	0.007
Discussion Variables: Statistics and Econometrics N=326							
Discussion: Student(s) with Student(s)	0.800**	(0.031)	0.080	(0.046)	-0.061	(0.062)	0.016
Discussion: Instructor(s) with Student(s)	0.927**	(0.020)	0.051*	(0.025)	0.029	(0.032)	0.010
Clickers or Other Devices	0.200**	(0.031)	-0.004	(0.052)	0.003	(0.058)	0.000
Activities Variables: Statistics and Econometrics N=298							
Classroom Experiments	0.257**	(0.036)	-0.007	(0.059)	0.034	(0.068)	0.001
Games & Simulations	0.355**	(0.039)	0.038	(0.066)	-0.017	(0.072)	0.002
Cooperative Learning/Small-Group Assignments	0.658**	(0.039)	0.116	(0.060)	-0.045	(0.073)	0.017
Computer Lab Assignments	0.658**	(0.039)	0.152**	(0.058)	0.020	(0.071)	0.021
Student Self-Assessments of Learning	0.125**	(0.027)	0.065	(0.051)	0.133*	(0.062)	0.019
Classroom Lessons or Activities that Address Diversity and Inclusion Issues	0.125**	(0.027)	0.125*	(0.055)	0.036	(0.054)	0.020
Classroom Lessons or Activities that Address Gender Issues	0.099**	(0.024)	0.139**	(0.053)	0.046	(0.051)	0.028
References to Diversity and Inclusion Issues	0.368**	(0.039)	0.096	(0.067)	-0.014	(0.073)	0.009

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

References to Gender Issues	0.401**	(0.040)	0.134*	(0.068)	-0.030	(0.073)	0.017
References to Literature, Drama, or Music Lyrics	0.230**	(0.034)	0.067	(0.061)	0.044	(0.066)	0.005
References to Sports	0.375**	(0.039)	0.006	(0.066)	0.206**	(0.074)	0.028
Studies of Lives or Work of Nobel Prize or Other Eminent Economists	0.211**	(0.033)	0.099	(0.061)	-0.081	(0.054)	0.023
Other Activities	0.033*	(0.015)	0.039	(0.032)	-0.001	(0.027)	0.007
Materials Variables: Statistics and Econometrics N=290							
Textbooks (print)	0.767**	(0.035)	-0.054	(0.062)	0.067	(0.060)	0.010
Textbooks (online/electronic)	0.547**	(0.041)	-0.047	(0.069)	0.003	(0.076)	0.002
Publisher-developed Workbooks/Study Guides (print)	0.047**	(0.017)	0.016	(0.032)	0.053	(0.043)	0.007
Publisher-developed Online Workbook/Tutorial Assignment	0.160**	(0.030)	-0.023	(0.049)	0.057	(0.061)	0.006
Adaptive Learning Assignments	0.073**	(0.021)	0.014	(0.038)	-0.023	(0.035)	0.002
Instructor-developed Class Notes	0.733**	(0.036)	-0.133*	(0.066)	-0.267**	(0.074)	0.049
Instructor-developed Problem Sets	0.887**	(0.026)	0.038	(0.039)	-0.137*	(0.062)	0.035
Press Readings	0.367**	(0.040)	0.146*	(0.069)	0.083	(0.076)	0.016
Scholarly Readings	0.453**	(0.041)	0.284**	(0.064)	-0.070	(0.075)	0.077
Other Materials	0.053**	(0.018)	0.034	(0.037)	-0.053**	(0.018)	0.019
Database Variables: Statistics and Econometrics N=289							
Federal Reserve Databases	0.595**	(0.041)	0.171**	(0.062)	0.089	(0.073)	0.024
Other Government Databases	0.696**	(0.038)	0.193**	(0.052)	0.071	(0.067)	0.037
Other Databases	0.196**	(0.033)	0.039	(0.058)	-0.096	(0.051)	0.015
Literature Searches of Published and Working Paper Research Variables: Statistics and Econometrics N=279							

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Library Holdings	0.392**	(0.041)	0.165*	(0.070)	0.065	(0.078)	0.020
Internet	0.594**	(0.041)	0.254**	(0.058)	0.090	(0.074)	0.054
EconLit	0.322**	(0.039)	0.235**	(0.069)	0.134	(0.077)	0.043
Other Databases	0.084**	(0.023)	0.055	(0.046)	-0.014	(0.041)	0.008
Grading Variables: Statistics and Econometrics N=276							
Exams with Multiple-Choice Questions	0.340**	(0.040)	-0.081	(0.064)	0.108	(0.077)	0.019
Exams with Long-answer Essay/Questions	0.319**	(0.039)	0.057	(0.068)	-0.112	(0.066)	0.016
Shorter Papers	0.128**	(0.028)	0.158**	(0.059)	0.079	(0.060)	0.030
Other Written Assignments	0.099**	(0.025)	0.057	(0.049)	-0.013	(0.045)	0.008
Oral Presentations	0.255**	(0.037)	0.069	(0.065)	0.003	(0.069)	0.005
Publisher-developed Online Homework Assignments	0.113**	(0.027)	-0.049	(0.039)	-0.027	(0.046)	0.005
Publisher-developed Adaptive Assignments	0.035*	(0.016)	-0.022	(0.020)	-0.001	(0.029)	0.004
Instructor-developed Online Quizzes and Exams	0.099**	(0.025)	0.018	(0.045)	0.004	(0.048)	0.001
Exams with Short-answer Essay/Questions	0.674**	(0.040)	0.079	(0.063)	0.085	(0.069)	0.008
Term Papers	0.433**	(0.042)	0.126	(0.071)	0.016	(0.078)	0.012
Homework/Problem Sets	0.823**	(0.032)	0.047	(0.050)	-0.030	(0.062)	0.005
Class Participation	0.404**	(0.042)	-0.054	(0.069)	-0.025	(0.076)	0.002
Performance in Games; Simulations; or Experiments	0.014	(0.010)	0.064*	(0.032)	0.055	(0.035)	0.022
Instructor-developed Online Homework Assignments	0.099**	(0.025)	0.005	(0.043)	0.004	(0.048)	0.000
Publisher-developed Online Quizzes and Exams	0.035*	(0.016)	0.016	(0.030)	0.034	(0.037)	0.004
Group Work	0.028*	(0.014)	-0.002	(0.023)	-0.011	(0.022)	0.001
Group work worth 10% or more of grade	0.426**	(0.042)	0.146*	(0.070)	-0.098	(0.075)	0.031
Multiple Choice Exams worth 75% or more of grade	0.014	(0.010)	-0.014	(0.010)	0.038	(0.031)	0.019
Multiple Choice Exams worth 50% or less of grade	0.901**	(0.025)	0.073*	(0.031)	-0.004	(0.048)	0.015

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Math Importance Variables: Statistics and Econometrics N=273							
Numerical Calculations Extremely Important	0.643**	(0.041)	0.015	(0.068)	0.199**	(0.063)	0.029
Graphs Extremely Important	0.407**	(0.042)	-0.091	(0.068)	-0.021	(0.077)	0.006
Algebra Extremely Important	0.586**	(0.042)	-0.033	(0.071)	-0.007	(0.078)	0.001
Calculus Extremely Important	0.307**	(0.039)	-0.044	(0.064)	-0.114	(0.066)	0.010
Numerical Calculations Fairly or Extremely Important	0.807**	(0.034)	-0.044	(0.059)	0.088	(0.053)	0.014
Graphs Fairly or Extremely Important	0.593**	(0.042)	0.012	(0.070)	0.039	(0.077)	0.001
Algebra Fairly or Extremely Important	0.771**	(0.036)	-0.035	(0.062)	-0.052	(0.070)	0.003
Calculus Fairly or Extremely Important	0.464**	(0.042)	-0.070	(0.071)	-0.166*	(0.074)	0.017
In-Class Presentation Variables: Other Upper-division Courses N=579							
Traditional Lectures	0.614**	(0.024)	-0.291**	(0.042)	-0.013	(0.044)	0.061
Traditional Lectures: 2020 Method	0.419**	(0.024)	-0.255**	(0.037)	-0.090*	(0.043)	0.050
Chalkboard or Whiteboard Text/Graphs	0.905**	(0.014)	0.067**	(0.019)	0.020	(0.025)	0.011
PowerPoint or Other Computer-Generated Displays	0.898**	(0.015)	-0.029	(0.029)	0.033	(0.024)	0.005
Overhead Projector Displays/Document Camera	0.393**	(0.024)	-0.120**	(0.041)	0.098*	(0.045)	0.025
DVD/VCR Tapes; Films; or Movie/Internet Clips	0.626**	(0.024)	0.014	(0.043)	0.109**	(0.041)	0.011
Team Teaching	0.156**	(0.018)	0.013	(0.033)	0.029	(0.034)	0.001
Guest Lectures	0.531**	(0.024)	-0.023	(0.044)	-0.016	(0.045)	0.002
Discussion Variables: Other Upper-division Courses N=579							
Discussion: Student(s) with Student(s)	0.840**	(0.018)	0.094**	(0.026)	0.041	(0.031)	0.022
Discussion: Instructor(s) with Student(s)	0.955**	(0.010)	0.040**	(0.012)	0.022	(0.016)	0.009
Clickers or Other Devices	0.200**	(0.020)	-0.004	(0.035)	0.013	(0.037)	0.001

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Activities Variables: Other Upper-division Courses N=545							
Classroom Experiments	0.347**	(0.025)	0.071	(0.045)	0.065	(0.047)	0.006
Games & Simulations	0.384**	(0.025)	0.087	(0.046)	0.093	(0.048)	0.010
Cooperative Learning/Small-Group Assignments	0.645**	(0.025)	0.178**	(0.038)	0.041	(0.045)	0.029
Computer Lab Assignments	0.221**	(0.021)	0.126**	(0.042)	0.066	(0.043)	0.015
Student Self-Assessments of Learning	0.157**	(0.019)	0.060	(0.037)	0.058	(0.038)	0.006
Classroom Lessons or Activities that Address Diversity and Inclusion Issues	0.149**	(0.018)	0.057	(0.036)	0.001	(0.034)	0.005
Classroom Lessons or Activities that Address Gender Issues	0.157**	(0.019)	0.031	(0.035)	0.006	(0.035)	0.001
References to Diversity and Inclusion Issues	0.456**	(0.026)	0.073	(0.046)	0.015	(0.048)	0.005
References to Gender Issues	0.472**	(0.026)	0.081	(0.046)	0.044	(0.048)	0.006
References to Literature; Drama; or Music Lyrics	0.376**	(0.025)	-0.023	(0.045)	0.036	(0.047)	0.003
References to Sports	0.384**	(0.025)	-0.008	(0.045)	0.185**	(0.047)	0.026
Studies of Lives or Work of Nobel Prize or Other Eminent Economists	0.288**	(0.023)	-0.017	(0.041)	0.032	(0.045)	0.002
Other Activities	0.072**	(0.013)	-0.025	(0.021)	-0.000	(0.025)	0.002
Materials Variables: Other Upper-division Courses N=572							
Textbooks (print)	0.695**	(0.023)	0.055	(0.041)	0.098*	(0.040)	0.009
Textbooks (online/electronic)	0.517**	(0.025)	-0.070	(0.046)	0.070	(0.047)	0.010
Publisher-developed Workbooks/Study Guides (print)	0.041**	(0.010)	0.006	(0.019)	0.068*	(0.027)	0.036
Publisher-developed Online Workbook/Tutorial Assignment	0.075**	(0.013)	-0.004	(0.024)	0.112**	(0.034)	0.037
Adaptive Learning Assignments	0.070**	(0.013)	-0.016	(0.022)	0.008	(0.025)	0.001
Instructor-developed Class Notes	0.615**	(0.025)	-0.091*	(0.046)	-0.112*	(0.047)	0.012
Instructor-developed Problem Sets	0.773**	(0.021)	0.061	(0.036)	-0.044	(0.042)	0.012

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Press Readings	0.615**	(0.025)	0.105*	(0.043)	0.011	(0.046)	0.011
Scholarly Readings	0.744**	(0.022)	0.089*	(0.036)	-0.099*	(0.044)	0.025
Other Materials	0.067**	(0.013)	-0.014	(0.022)	0.010	(0.025)	0.001
Database Variables: Other Upper-division Courses N=571							
Federal Reserve Databases	0.558**	(0.025)	0.100*	(0.044)	0.140**	(0.044)	0.017
Other Government Databases	0.668**	(0.024)	0.132**	(0.039)	0.144**	(0.039)	0.025
Other Databases	0.182**	(0.020)	0.006	(0.036)	-0.012	(0.036)	0.007
Literature Searches of Published and Working Paper Research Variables: Other Upper-division Courses N=571							
Library Holdings	0.524**	(0.026)	0.155**	(0.044)	0.110*	(0.047)	0.021
Internet	0.723**	(0.023)	0.134**	(0.036)	0.067	(0.040)	0.022
EconLit	0.452**	(0.026)	0.203**	(0.045)	0.156**	(0.047)	0.035
Other Databases	0.080**	(0.014)	0.021	(0.027)	0.018	(0.028)	0.001
Grading Variables: Other Upper-division Courses N=581							
Exams with Multiple-Choice Questions	0.335**	(0.025)	-0.071	(0.043)	0.107*	(0.048)	0.019
Exams with Long-answer Essay/Questions	0.436**	(0.026)	0.030	(0.047)	-0.007	(0.048)	0.003
Shorter Papers	0.360**	(0.025)	0.235**	(0.046)	0.048	(0.048)	0.040
Other Written Assignments	0.191**	(0.021)	0.012	(0.038)	-0.048	(0.036)	0.003
Oral Presentations	0.469**	(0.026)	0.188**	(0.046)	-0.067	(0.048)	0.036
Publisher-developed Online Homework Assignments	0.049**	(0.011)	-0.018	(0.018)	0.053	(0.027)	0.012
Publisher-developed Adaptive Assignments	0.019**	(0.007)	-0.007	(0.011)	0.008	(0.015)	0.001
Instructor-developed Online Quizzes and Exams	0.112**	(0.016)	-0.044	(0.026)	0.011	(0.032)	0.005
Exams with Short-answer Essay/Questions	0.695**	(0.024)	-0.020	(0.044)	-0.096*	(0.047)	0.007
Term Papers	0. 480**	(0.026)	0.177**	(0.046)	0.024	(0.049)	0.023

Table B.2 OLS estimates, school effects by Carnegie classifications (Robust SEs in parentheses), Intermediate Theory; Statistics, Econometrics, and Math Economics (continued)

Homework/Problem Sets	0.621**	(0.025)	-0.014	(0.046)	-0.063	(0.048)	0.005
Class Participation	0.499**	(0.026)	0.096*	(0.047)	0.059	(0.049)	0.009
Performance in Games; Simulations; or Experiments	0.060**	(0.012)	0.014	(0.024)	0.035	(0.027)	0.003
Instructor-developed Online Homework Assignments	0.074**	(0.014)	-0.018	(0.023)	0.015	(0.027)	0.002
Publisher-developed Online Quizzes and Exams	0.019**	(0.007)	0.012	(0.015)	0.049*	(0.022)	0.012
Group Work	0.049**	(0.011)	0.025	(0.023)	0.012	(0.023)	0.002
Group work worth 10% or more of grade	0.512**	(0.026)	0.114*	(0.046)	-0.036	(0.049)	0.014
Multiple Choice Exams worth 75% or more of grade	0.008	(0.005)	-0.008	(0.005)	0.019	(0.014)	0.009
Multiple Choice Exams worth 50% or less of grade	0.937**	(0.013)	0.038*	(0.018)	-0.060*	(0.030)	0.018
Math Importance Variables: Other Upper-division Courses N=578							
Numerical Calculations Extremely Important	0.297**	(0.024)	-0.053	(0.042)	0.059	(0.046)	0.010
Graphs Extremely Important	0.505**	(0.026)	-0.005	(0.048)	0.056	(0.049)	0.004
Algebra Extremely Important	0.338**	(0.025)	-0.007	(0.045)	0.046	(0.047)	0.003
Calculus Extremely Important	0.135**	(0.018)	0.040	(0.035)	-0.046	(0.030)	0.007
Numerical Calculations Fairly or Extremely Important	0.558**	(0.026)	-0.064	(0.047)	0.072	(0.048)	0.010
Graphs Fairly or Extremely Important	0.736**	(0.023)	0.026	(0.041)	0.065	(0.040)	0.004
Algebra Fairly or Extremely Important	0.577**	(0.026)	0.023	(0.047)	0.046	(0.048)	0.002
Calculus Fairly or Extremely Important	0.250**	(0.023)	0.031	(0.042)	-0.106**	(0.037)	0.014

Standard errors in parentheses
* $p < .05$, ** $p < .01$

APPENDIX C

Chapter 5 Full tables

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete

Principles Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Assoc.	Bacc.	Master	Proteach	Exp.	TT Load	Class size
In-Class Presentation N=509												
Lecture usually or always	-0.151**	-0.042	-0.039	-0.099	-0.044	-0.067	-0.030	0.077	-0.005	0.002	-0.137*	0.000
	(0.047)	(0.083)	(0.080)	(0.060)	(0.058)	(0.188)	(0.057)	(0.050)	(0.003)	(0.008)	(0.060)	(0.000)
Lecture usually or always: 2020 Scale	-0.222**	-0.112	-0.030	-0.111	0.012	0.182	-0.026	0.052	-0.007*	-0.001	-0.136**	0.000
	(0.047)	(0.095)	(0.093)	(0.068)	(0.065)	(0.183)	(0.070)	(0.067)	(0.003)	(0.009)	(0.046)	(0.001)
Chalkboard or whiteboard use	0.041	-0.018	0.019	-0.062	0.048		0.068*	0.023	0.000	0.005	0.013	-0.001**
	(0.026)	(0.046)	(0.048)	(0.053)	(0.034)		(0.034)	(0.036)	(0.002)	(0.005)	(0.021)	(0.000)
PowerPoint use	0.050	0.073	0.122	0.065	0.107	-0.172	0.090	0.130*	-0.006	0.004	-0.019	0.001
	(0.048)	(0.080)	(0.076)	(0.061)	(0.067)	(0.223)	(0.056)	(0.056)	(0.004)	(0.010)	(0.036)	(0.000)
Overhead projector use	-0.006	-0.006	0.126	0.115	0.107	0.233	-0.165**	0.048	-0.007*	0.015	0.111	0.001**
	(0.048)	(0.089)	(0.089)	(0.069)	(0.067)	(0.192)	(0.060)	(0.067)	(0.003)	(0.009)	(0.074)	(0.000)
Movie or video clip use	0.118*	0.091	0.099	0.008	0.073	-0.132	-0.002	0.050	-0.001	0.018	0.037	0.000
	(0.046)	(0.089)	(0.084)	(0.068)	(0.064)	(0.183)	(0.067)	(0.067)	(0.003)	(0.010)	(0.049)	(0.000)
Team teaching	0.031	-0.061	-0.031	-0.009	0.019	0.120	0.030	0.026	-0.003	-0.009	-0.019	0.000
	(0.030)	(0.031)	(0.039)	(0.038)	(0.040)	(0.149)	(0.043)	(0.042)	(0.002)	(0.006)	(0.021)	(0.000)
Guest lectures	0.092*	-0.004	0.114	-0.064	0.027	-0.103	-0.020	-0.001	-0.001	0.012	-0.018	0.001
	(0.045)	(0.074)	(0.082)	(0.051)	(0.056)	(0.127)	(0.054)	(0.055)	(0.003)	(0.007)	(0.033)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

Discussion N=512												
Student-to-student Discussion	0.117**	0.045	-0.001	-0.043	-0.020		0.072	-0.065	-0.001	-0.014*	-0.123	-0.000
	(0.037)	(0.060)	(0.074)	(0.055)	(0.054)		(0.045)	(0.061)	(0.003)	(0.007)	(0.068)	(0.000)
Student-to-teacher Discussion	0.08	0.024	0.044	0.008	0.035		0.043	0.021	-0.003	0.005	-0.013	-0.001
	(0.041)	(0.049)	(0.046)	(0.046)	(0.038)		(0.044)	(0.048)	(0.003)	(0.006)	(0.049)	(0.000)
Clicker use	0.020	0.040	0.065	0.119	-0.011	0.145	0.006	0.013	-0.001	-0.003	0.050	0.002**
	(0.042)	(0.082)	(0.079)	(0.061)	(0.055)	(0.184)	(0.059)	(0.057)	(0.003)	(0.008)	(0.044)	(0.001)
Activities N=495												
Experiments	0.075	-0.196*	-0.089	-0.127	0.061	-0.311	0.013	-0.111	-0.000	0.007	0.134*	-0.000
	(0.048)	(0.087)	(0.092)	(0.068)	(0.064)	(0.161)	(0.067)	(0.066)	(0.003)	(0.010)	(0.068)	(0.000)
Games and Simulations	0.044	0.014	-0.001	0.028	-0.127*	0.041	0.004	-0.016	-0.002	-0.010	0.078	0.000
	(0.049)	(0.091)	(0.093)	(0.069)	(0.064)	(0.191)	(0.067)	(0.067)	(0.003)	(0.010)	(0.065)	(0.000)
Cooperative Learning	0.211**	-0.007	-0.037	-0.026	0.052	-0.287	0.108	-0.093	0.001	0.005	0.104	0.000
	(0.045)	(0.093)	(0.095)	(0.069)	(0.068)	(0.178)	(0.068)	(0.070)	(0.003)	(0.010)	(0.064)	(0.000)
Computer Lab Assignments	0.007	0.098	0.065	0.08	-0.024	0.025	0.065	0.038	0.000	0.006	0.041	0.000
	(0.024)	(0.063)	(0.057)	(0.042)	(0.028)	(0.098)	(0.041)	(0.037)	(0.002)	(0.004)	(0.036)	(0.000)
Self-assessments	0.090*	0.033	0.040	0.016	0.013	0.149	0.032	0.003	0.000	0.004	0.029	0
	(0.038)	(0.058)	(0.059)	(0.041)	(0.038)	(0.170)	(0.042)	(0.039)	(0.002)	(0.005)	(0.038)	(0.000)
Lessons/Activities on Diversity and Inclusion Issues	0.037	-0.034	0.008	-0.065	-0.100**	0.035	0.089	-0.012	-0.000	0.004	-0.016	0.000
	(0.038)	(0.059)	(0.064)	(0.041)	(0.037)	(0.142)	(0.059)	(0.048)	(0.002)	(0.006)	(0.046)	(0.000)
Lessons/Activities on Gender Issues	0.059	-0.029	0.017	-0.039	-0.011		0.082	0.031	-0.002	0.003	0.006	0.000
	(0.033)	(0.040)	(0.050)	(0.030)	(0.032)		(0.049)	(0.041)	(0.002)	(0.005)	(0.031)	(0.000)
References to Diversity and Inclusion Issues	0.072	-0.063	-0.007	-0.089	-0.192**	-0.044	0.090	0.053	0.005	0.007	-0.131	0.000
	(0.049)	(0.088)	(0.091)	(0.067)	(0.059)	(0.185)	(0.067)	(0.067)	(0.003)	(0.009)	(0.070)	(0.000)
References to Gender Issues	0.076	-0.133	-0.040	-0.111	-0.071	-0.000	0.166*	0.094	0.000	0.001	-0.064	0.000
	(0.048)	(0.085)	(0.091)	(0.065)	(0.063)	(0.186)	(0.065)	(0.066)	(0.003)	(0.009)	(0.065)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

References to Literature, Drama, or Music	-0.101*	0.048	0.061	0.031	-0.227**	0.200	-0.036	-0.007	0.006	0.009	-0.067	0.001
	(0.048)	(0.091)	(0.091)	(0.068)	(0.058)	(0.177)	(0.067)	(0.067)	(0.003)	(0.009)	(0.068)	(0.000)
References to Sports	-0.239**	-0.080	-0.142	-0.114	-0.245**	0.21	-0.021	0.132*	0.000	-0.018*	-0.052	-0.000
	(0.048)	(0.091)	(0.090)	(0.067)	(0.067)	(0.115)	(0.065)	(0.058)	(0.003)	(0.009)	(0.062)	(0.000)
Studies of Lives or Work of Nobel Prize or Other Eminent Economists	0.020	0.001	0.164	-0.046	-0.028	-0.094	-0.000	-0.007	0.002	0.016*	-0.119*	0.000
	(0.042)	(0.077)	(0.086)	(0.057)	(0.054)	(0.120)	(0.057)	(0.057)	(0.003)	(0.007)	(0.059)	(0.000)
Other Activities	-0.001	0.045	0.005	0.044	-0.023		-0.001	0.011	-0.001	0.006*	0.014	0.000
	(0.013)	(0.041)	(0.023)	(0.030)	(0.014)		(0.018)	(0.019)	(0.001)	(0.003)	(0.018)	(0.000)
Materials N=511												
Print Textbook	-0.034	-0.064	-0.065	-0.078	-0.048	-0.096	0.101*	0.057	0.000	-0.002	-0.075*	-0.001
	(0.043)	(0.082)	(0.081)	(0.062)	(0.059)	(0.186)	(0.050)	(0.052)	(0.003)	(0.008)	(0.038)	(0.000)
Online Textbook	0.064	-0.063	-0.006	-0.032	-0.003	0.131	-0.164**	-0.041	-0.004	0.002	0.054	0.000
	(0.035)	(0.080)	(0.072)	(0.056)	(0.053)	(0.102)	(0.062)	(0.056)	(0.003)	(0.007)	(0.036)	(0.000)
Publisher-developed Workbooks/Study Guides (print)	0.002	0.018	0.099*	0.022	0.050	0.103	0.002	0.035	-0.000	0.002	0.006	0.000
	(0.048)	(0.087)	(0.092)	(0.069)	(0.065)	(0.192)	(0.062)	(0.066)	(0.003)	(0.009)	(0.046)	(0.000)
Publisher-developed Online Workbook/Tutorial Assignment	-0.020	-0.062	-0.046	0.001	0.066	0.012	-0.172**	-0.012	-0.002	0.006	0.062	0.001
	(0.048)	(0.087)	(0.092)	(0.069)	(0.065)	(0.192)	(0.062)	(0.066)	(0.003)	(0.009)	(0.046)	(0.000)
Adaptive Learning Assignments	0.022	0.106	0.165*	0.023	0.140*	0.090	-0.098*	-0.087*	-0.004	0.009	0.082*	0.001
	(0.038)	(0.078)	(0.083)	(0.054)	(0.062)	(0.174)	(0.042)	(0.042)	(0.002)	(0.007)	(0.035)	(0.000)
Instructor-developed Class Notes	-0.039	0.080	0.124	0.188**	0.034	0.188	-0.000	-0.065	-0.000	0.005	0.053	-0.000
	(0.048)	(0.089)	(0.089)	(0.065)	(0.064)	(0.181)	(0.066)	(0.065)	(0.003)	(0.009)	(0.060)	(0.000)
Instructor-developed Problem Sets	0.008	-0.018	0.089	-0.035	0.003	0.117	0.194**	0.010	0.003	0.002	0.163**	-0.000
	(0.047)	(0.089)	(0.084)	(0.066)	(0.063)	(0.141)	(0.057)	(0.059)	(0.003)	(0.009)	(0.060)	(0.001)
Press Readings	0.160**	-0.024	0.040	0.061	-0.073	-0.147	0.070	0.043	-0.000	0.007	-0.001	-0.000
	(0.046)	(0.090)	(0.089)	(0.069)	(0.064)	(0.190)	(0.067)	(0.066)	(0.003)	(0.009)	(0.043)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

Scholarly Readings	-0.040	-0.156*	0.030	-0.014	-0.064	-0.159	0.102	0.101	0.001	-0.001	-0.126**	-0.001
	(0.042)	(0.069)	(0.082)	(0.057)	(0.053)	(0.136)	(0.065)	(0.064)	(0.003)	(0.008)	(0.046)	(0.000)
Other Materials	0.019	0.007	0.018	-0.022	-0.020		-0.025	0.028	0.002	0.002	-0.025	-0.000
	(0.023)	(0.038)	(0.043)	(0.021)	(0.022)		(0.020)	(0.027)	(0.001)	(0.004)	(0.013)	(0.000)
Databases N=512												
Federal Reserve Economic Data	0.086	0.192*	0.186*	0.093	-0.020	0.382**	0.138*	0.138*	0.002	0.001	0.100*	0.001
	(0.050)	(0.090)	(0.089)	(0.069)	(0.067)	(0.134)	(0.067)	(0.068)	(0.003)	(0.009)	(0.046)	(0.000)
Other Government Databases	0.103*	0.012	0.146	0.019	0.037	0.388**	0.113	0.162*	0.004	0.008	-0.004	0.001
	(0.050)	(0.093)	(0.089)	(0.069)	(0.066)	(0.142)	(0.067)	(0.067)	(0.003)	(0.009)	(0.092)	(0.000)
Other Databases	0.012	-0.038	0.061	0.002	0.014	0.121	0.007	0.003	-0.000	0.002	0.010	0.000
	(0.019)	(0.022)	(0.040)	(0.023)	(0.027)	(0.141)	(0.027)	(0.025)	(0.001)	(0.003)	(0.019)	(0.000)
Literature Search of Research N=497												
Library Holdings	0.017	-0.009	0.083	0.031	0.039	0.042	0.129*	0.070	-0.002	0.006	-0.071*	0.000
	(0.035)	(0.065)	(0.074)	(0.050)	(0.052)	(0.148)	(0.059)	(0.053)	(0.002)	(0.006)	(0.035)	(0.001)
Internet Searches	0.079	0.058	0.103	0.026	0.016		0.075	-0.018	-0.001	0.003	-0.110	-0.001
	(0.049)	(0.089)	(0.089)	(0.067)	(0.066)		(0.064)	(0.063)	(0.003)	(0.009)	(0.069)	(0.000)
EconLit	0.041	0.041	0.076	-0.010	0.006	0.182	0.121*	0.086	-0.001	0.014**	-0.022	0.000
	(0.032)	(0.060)	(0.066)	(0.038)	(0.040)	(0.178)	(0.054)	(0.050)	(0.002)	(0.005)	(0.024)	(0.000)
Other Searches	-0.005		0.043	-0.003			0.015	0.007	0.000	0.001	0.002	0.000
	(0.005)		(0.032)	(0.006)			(0.015)	(0.009)	(0.000)	(0.001)	(0.007)	(0.000)
Grading N=513												
Exams with Multiple-Choice Questions	0.025	-0.045	-0.063	-0.020	0.040		-0.197**	0.005	-0.002	0.000	-0.005	0.001*
	(0.030)	(0.071)	(0.068)	(0.047)	(0.039)		(0.058)	(0.044)	(0.002)	(0.006)	(0.041)	(0.000)
Exams with Long-answer Essay/Questions	0.045	0.033	0.119	0.040	0.019	0.333	0.089*	0.063	0.001	0.006	0.001	-0.000
	(0.028)	(0.049)	(0.061)	(0.036)	(0.032)	(0.187)	(0.042)	(0.039)	(0.001)	(0.004)	(0.033)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

Shorter Papers	0.069	0.045	0.023	-0.015	0.004	0.075	0.162**	0.036	-0.001	0.007	0.000	-0.000
	(0.037)	(0.066)	(0.062)	(0.041)	(0.041)	(0.152)	(0.057)	(0.046)	(0.002)	(0.006)	(0.027)	(0.000)
Other Written Assignments	0.053	-0.027	0.053	0.071	-0.022	-0.018	-0.007	-0.040	-0.000	0.000	-0.023	-0.001
	(0.037)	(0.057)	(0.067)	(0.049)	(0.038)	(0.099)	(0.041)	(0.038)	(0.002)	(0.006)	(0.028)	(0.000)
Oral Presentations	0.059*	-0.022	0.072	0.022	0.054	-0.018	0.014	0.026	-0.000	-0.000	0.001	-0.000
	(0.027)	(0.025)	(0.045)	(0.025)	(0.035)	(0.045)	(0.025)	(0.026)	(0.001)	(0.003)	(0.015)	(0.000)
Publisher-developed Online Homework Assignments	0.036	-0.038	-0.074	0.017	-0.019	0.185	-0.133*	-0.005	0.002	-0.002	-0.005	0.001
	(0.047)	(0.082)	(0.083)	(0.067)	(0.062)	(0.182)	(0.059)	(0.063)	(0.003)	(0.009)	(0.041)	(0.000)
Publisher-developed Adaptive Assignments	-0.027	0.158*	-0.005	0.018	0.076	-0.032	-0.059	-0.06	0.002	0.000	0.071*	0.001**
	(0.027)	(0.074)	(0.053)	(0.044)	(0.052)	(0.090)	(0.033)	(0.032)	(0.002)	(0.006)	(0.031)	(0.000)
Instructor-developed Online Quizzes and Exams	0.017	0.063	0.036	0.013	0.042	0.019	-0.016	-0.001	-0.000	0.004	0.064	0.000
	(0.035)	(0.072)	(0.065)	(0.047)	(0.050)	(0.140)	(0.046)	(0.047)	(0.002)	(0.006)	(0.042)	(0.000)
Exams with Short-answer Essay/Questions	0.053	0.171*	0.035	-0.019	-0.197**	0.086	0.227**	0.034	0.006	-0.005	-0.048	-0.001**
	(0.050)	(0.087)	(0.093)	(0.071)	(0.060)	(0.171)	(0.063)	(0.067)	(0.003)	(0.009)	(0.045)	(0.000)
Term Papers	0.024	0.018	0.061	-0.038	0.037	-0.045	-0.017	-0.035	-0.002	0.003	0.055	-0.000
	(0.027)	(0.046)	(0.053)	(0.027)	(0.041)	(0.043)	(0.030)	(0.029)	(0.001)	(0.005)	(0.036)	(0.000)
Homework/Problem Sets	0.008	0.036	0.140	-0.002	0.081	0.068	0.217**	-0.003	-0.000	-0.008	-0.001	-0.000
	(0.049)	(0.090)	(0.089)	(0.067)	(0.065)	(0.183)	(0.064)	(0.065)	(0.003)	(0.009)	(0.043)	(0.000)
Class Participation	0.160**	0.144	0.158	-0.003	0.027	0.077	0.042	0.039	0.004	-0.003	-0.006	0.000
	(0.048)	(0.087)	(0.087)	(0.062)	(0.060)	(0.192)	(0.062)	(0.062)	(0.003)	(0.008)	(0.039)	(0.000)
Performance in Game, Simulations, or Experiments	0.010	-0.043	-0.012	0.011	-0.010	0.033	-0.021	-0.033	-0.001	-0.000	0.030	-0.000
	(0.027)	(0.041)	(0.047)	(0.038)	(0.033)	(0.119)	(0.034)	(0.034)	(0.002)	(0.005)	(0.028)	(0.000)
Instructor-developed Online Homework Assignments	0.024	0.013	0.006	0.036	0.031	0.208	-0.032	0.027	0.002	-0.004	0.013	0.000
	(0.029)	(0.045)	(0.046)	(0.039)	(0.037)	(0.189)	(0.031)	(0.037)	(0.002)	(0.005)	(0.021)	(0.000)
Publisher-developed Online Quizzes and Exams	-0.025	-0.024	0.025	0.072	0.056	0.259	-0.042	-0.032	-0.000	0.010*	0.032	0.001*
	(0.021)	(0.035)	(0.050)	(0.044)	(0.044)	(0.193)	(0.028)	(0.025)	(0.001)	(0.005)	(0.026)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

Group Work	0.136**	0.037	0.105	0.043	0.097	0.245	0.079	-0.026	-0.000	0.011	-0.010	-0.001
	(0.044)	(0.075)	(0.077)	(0.053)	(0.058)	(0.195)	(0.056)	(0.048)	(0.002)	(0.006)	(0.045)	(0.000)
Other Grading Methods	0.007	0.026	-0.001	0.009	-0.048*		0.026	-0.014	-0.001	0.002	-0.003	0.000
	(0.023)	(0.047)	(0.036)	(0.034)	(0.022)		(0.033)	(0.028)	(0.001)	(0.003)	(0.024)	(0.000)
Multiple-choice Exams worth 75% or more of semester grade	-0.158**	-0.081	-0.144	-0.013	0.042		-0.187**	0.005	-0.001	0.006	0.043	0.003**
	(0.049)	(0.074)	(0.077)	(0.067)	(0.075)		(0.057)	(0.064)	(0.003)	(0.009)	(0.068)	(0.001)
Multiple-choice Exams worth 50% or more of semester grade	-0.140**	-0.132	0.005	-0.005	0.091	-0.011	-0.321**	-0.080	-0.005	0.008	0.077	0.002**
	(0.051)	(0.093)	(0.094)	(0.071)	(0.066)	(0.177)	(0.061)	(0.066)	(0.003)	(0.010)	(0.045)	(0.000)
Multiple-choice Exams worth less than 50% of semester grade	0.140**	0.132	-0.005	0.005	-0.091	0.011	0.321**	0.080	0.005	-0.008	-0.077	-0.002**
	(0.051)	(0.093)	(0.094)	(0.071)	(0.066)	(0.177)	(0.061)	(0.066)	(0.003)	(0.010)	(0.045)	(0.000)
Group work worth more than 10% of semester grade	0.115**	0.041	0.083	0.059	0.088	0.106	0.063	0.036	-0.000	0.008	-0.003	-0.000
	(0.038)	(0.059)	(0.062)	(0.042)	(0.048)	(0.157)	(0.044)	(0.040)	(0.002)	(0.005)	(0.032)	(0.000)
Math Importance N=512												
Numerical Calculations Extremely Important	0.042	-0.059	-0.143*	-0.031	0.063	0.361*	0.063	-0.003	-0.002	-0.013	0.040	0.001
	(0.046)	(0.073)	(0.067)	(0.059)	(0.061)	(0.179)	(0.064)	(0.060)	(0.003)	(0.008)	(0.068)	(0.000)
Graphs Extremely Important	0.125**	0.012	0.073	0.041	0.002	0.228	0.095	-0.022	-0.001	0.005	0.148*	0.000
	(0.046)	(0.089)	(0.091)	(0.068)	(0.066)	(0.152)	(0.065)	(0.067)	(0.003)	(0.009)	(0.065)	(0.000)
Algebra Extremely Important	0.013	-0.104	-0.127*	-0.047	0.053	0.309	0.143*	0.083	-0.003	-0.015	0.111	0.000
	(0.039)	(0.061)	(0.059)	(0.051)	(0.057)	(0.189)	(0.064)	(0.060)	(0.002)	(0.008)	(0.060)	(0.000)
Calculus Extremely Important	0.000		0.000	0.000	0.000		0.000		0.000	0.000	0.000	0.000
	(0.000)		(0.000)	(0.000)	(0.000)		(0.000)		(0.000)	(0.000)	(0.000)	(0.000)
Numerical Calculations Fairly or Extremely Important	0.064	-0.038	-0.035	0.045	0.099	0.437**	0.140*	0.054	-0.003	-0.002	-0.021	0.000
	(0.048)	(0.088)	(0.089)	(0.067)	(0.065)	(0.106)	(0.065)	(0.066)	(0.003)	(0.009)	(0.047)	(0.000)
Graphs Fairly or Extremely Important	0.095**	-0.003	0.020	-0.099	-0.018	0.002	0.064	0.049	0.004	0.007	-0.070	-0.000
	(0.032)	(0.070)	(0.063)	(0.060)	(0.056)	(0.120)	(0.045)	(0.042)	(0.003)	(0.007)	(0.044)	(0.000)

Table C.1 Probit Marginal Effects Estimates: Principles Courses, complete (continued)

Algebra Fairly or Extremely Important	0.065	-0.031	-0.045	0.052	0.160*	0.279	0.216**	0.056	-0.000	-0.014	-0.047	0.001
	(0.046)	(0.080)	(0.079)	(0.063)	(0.065)	(0.182)	(0.064)	(0.062)	(0.003)	(0.008)	(0.037)	(0.000)
Calculus Fairly or Extremely Important	0.002	0.018	0.003	0.009	0.006	0.055	0.001	-0.000	0.000	-0.000	-0.000	-0.000
	(0.003)	(0.013)	(0.004)	(0.008)	(0.011)	(0.060)	(0.002)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)

Standard errors in parentheses
* $p < .05$, ** $p < .01$

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete

Intermediate Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
In-Class Presentation N=305											
Lecture usually or always	-0.152*	-0.106	0.065	0.038	-0.092	-0.012	-0.078	-0.007*	0.007	-0.019	0.000
	(0.062)	(0.115)	(0.089)	(0.064)	(0.074)	(0.068)	(0.075)	(0.004)	(0.011)	(0.068)	(0.002)
Lecture usually or always: 2020 Scale	-0.128*	-0.225	-0.031	-0.078	0.020	-0.047	-0.110	-0.008	-0.004	-0.055	0.002
	(0.064)	(0.123)	(0.119)	(0.082)	(0.076)	(0.082)	(0.086)	(0.004)	(0.013)	(0.082)	(0.002)
Discussion N=305											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
Student-to-student Discussion	0.137**	0.015	0.007	-0.068	-0.052	0.121	-0.106	0.000	-0.008	0.022	-0.004*
Activities	N=284										
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
Cooperative Learning	0.241**	0.002	0.054	-0.045	-0.003	0.171	-0.062	-0.001	0.011	0.111	-0.001
	(0.064)	(0.133)	(0.134)	(0.094)	(0.088)	(0.089)	(0.093)	(0.005)	(0.015)	(0.083)	(0.003)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

References to Literature, Drama, or Music	-0.125*	0.071	0.107	0.010	-0.244**	-0.036	0.026	-0.001	0.014	0.021	-0.003
	(0.063)	(0.136)	(0.132)	(0.093)	(0.071)	(0.090)	(0.096)	(0.004)	(0.014)	(0.075)	(0.003)
References to Sports	-0.226**	0.079	0.013	-0.018	-0.233**	-0.056	0.111	0.001	-0.018	-0.049	-0.006*
	(0.063)	(0.139)	(0.137)	(0.092)	(0.076)	(0.091)	(0.090)	(0.005)	(0.015)	(0.081)	(0.003)
Materials N=305											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
Press Readings	0.133*	-0.198	0.189	0.148	-0.015	0.111	-0.064	0.003	0.028*	0.016	-0.004
	(0.066)	(0.113)	(0.121)	(0.088)	(0.083)	(0.086)	(0.087)	(0.004)	(0.013)	(0.077)	(0.002)
Grading N=307											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
Exams with Multiple-Choice Questions	0.130*	-0.209	-0.129	-0.091	0.185*	-0.017	0.116	-0.001	-0.015	0.167	0.002
	(0.063)	(0.110)	(0.121)	(0.085)	(0.078)	(0.085)	(0.094)	(0.004)	(0.014)	(0.097)	(0.002)
Group work worth more than 10% of semester grade	0.135*	0.054	0.070	-0.009	0.123	0.119	0.068	0.000	0.008	-0.135*	-0.001
	(0.058)	(0.096)	(0.102)	(0.062)	(0.073)	(0.071)	(0.072)	(0.003)	(0.009)	(0.065)	(0.002)
Math Importance	*N=307*										
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Inter
Numerical Calculations Extremely Important	0.162**	0.064	-0.117	-0.104	0.025	-0.066	-0.055	-0.002	-0.007	0.024	-0.001
	(0.062)	(0.127)	(0.123)	(0.085)	(0.081)	(0.085)	(0.090)	(0.004)	(0.013)	(0.076)	(0.002)
Graphs Extremely Important	0.148**	0.173	-0.070	0.010	-0.014	-0.016	-0.036	0.004	-0.011	0.013	-0.005*
	(0.054)	(0.089)	(0.126)	(0.086)	(0.080)	(0.083)	(0.092)	(0.004)	(0.012)	(0.074)	(0.002)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

Numerical Calculations Fairly or Extremely Important	0.096*	0.053	-0.062	-0.096	0.016	-0.163*	-0.045	-0.001	-0.013	0.044	-0.004
	(0.046)	(0.095)	(0.104)	(0.076)	(0.064)	(0.082)	(0.077)	(0.004)	(0.010)	(0.057)	(0.002)

Statistics and Econometrics

Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
In-Class Presentation N=224											
Lecture usually or always: 2020 Scale	-0.158*	0.023	-0.090	-0.029	0.113	-0.041	0.090	-0.002	-0.013	-0.114	0.001
	(0.073)	(0.170)	(0.132)	(0.102)	(0.089)	(0.094)	(0.103)	(0.005)	(0.014)	(0.126)	(0.006)
Discussion	N=224										
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
Student-to-teacher Discussion	0.140*	-0.063	0.122	0.071	0.048	0.115	0.086	-0.013	0.014	0.074	-0.009
	(0.066)	(0.156)	(0.088)	(0.086)	(0.080)	(0.078)	(0.075)	(0.009)	(0.015)	(0.119)	(0.006)
Activities N=217											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
Cooperative Learning	0.223**	0.107	0.070	0.067	-0.066	0.125	-0.074	-0.008	0.009	-0.005	0.005
	(0.072)	(0.169)	(0.138)	(0.103)	(0.091)	(0.094)	(0.111)	(0.006)	(0.014)	(0.140)	(0.007)
Computer Lab Assignments	0.132*	-0.160	-0.256	-0.158	-0.110	0.148*	0.046	-0.002	0.004	0.169	0.006
	(0.054)	(0.174)	(0.136)	(0.101)	(0.087)	(0.069)	(0.084)	(0.004)	(0.012)	(0.112)	(0.005)
References to Diversity and Inclusion Issues	0.161*	-0.044	0.003	0.019	-0.099	0.181	0.096	0.003	0.006	-0.026	0.004
	(0.076)	(0.136)	(0.125)	(0.092)	(0.066)	(0.093)	(0.101)	(0.004)	(0.013)	(0.117)	(0.005)
References to Gender Issues	0.215**	-0.238	-0.207	-0.000	-0.007	0.196*	0.003	0.002	-0.026	-0.111	0.010
	(0.076)	(0.126)	(0.126)	(0.102)	(0.088)	(0.092)	(0.105)	(0.005)	(0.015)	(0.130)	(0.006)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
Materials N=221											
Press Readings	0.206**	0.164	0.007	-0.021	-0.182**	0.188*	0.135	0.004	0.013	0.035	0.017**
	(0.078)	(0.166)	(0.128)	(0.093)	(0.063)	(0.094)	(0.105)	(0.005)	(0.013)	(0.122)	(0.006)
Scholarly Readings	0.184*	-0.252	-0.083	-0.100	-0.123	0.367**	0.028	0.007	0.003	-0.160	-0.000
	(0.079)	(0.147)	(0.143)	(0.100)	(0.085)	(0.087)	(0.107)	(0.005)	(0.015)	(0.148)	(0.006)

Grading	N=224										
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Stats.
Term Papers	0.193**	-0.225	-0.021	-0.049	-0.001	0.024	-0.095	0.006	0.012	0.082	-0.011
	(0.075)	(0.155)	(0.140)	(0.101)	(0.087)	(0.095)	(0.100)	(0.005)	(0.014)	(0.134)	(0.006)

Other Upper Division Courses

Variable	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
In-Class Presentation N=579											
Lecture usually or always	-0.208**	0.022	0.051	0.012	0.044	-0.198**	0.034	-0.002	-0.001	-0.036	0.006**
	(0.046)	(0.092)	(0.084)	(0.060)	(0.057)	(0.063)	(0.062)	(0.003)	(0.008)	(0.063)	(0.002)
Lecture usually or always: 2020 Scale	-0.216**	0.028	-0.037	-0.011	0.086	-0.141*	0.031	0.003	-0.010	-0.057	0.007**
	(0.043)	(0.102)	(0.094)	(0.066)	(0.065)	(0.063)	(0.068)	(0.003)	(0.009)	(0.067)	(0.002)
Movie or video clip use	0.146**	0.059	0.166	0.028	-0.008	-0.020	0.111	-0.004	0.004	0.142*	0.003
	(0.045)	(0.098)	(0.088)	(0.065)	(0.063)	(0.064)	(0.070)	(0.003)	(0.009)	(0.071)	(0.002)
Guest lectures	0.140**	-0.145	-0.104	-0.054	-0.058	-0.047	-0.071	0.003	-0.001	-0.112	0.002
	(0.043)	(0.094)	(0.089)	(0.064)	(0.060)	(0.063)	(0.067)	(0.003)	(0.009)	(0.070)	(0.002)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

Discussion N=579

	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
Student-to-student Discussion	0.088**	0.002	-0.055	-0.119*	0.014	0.048	-0.011	0.002	-0.005	0.034	0.001
	(0.026)	(0.062)	(0.064)	(0.055)	(0.038)	(0.036)	(0.046)	(0.002)	(0.005)	(0.038)	(0.002)

Activities N=545

	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
Cooperative Learning	0.277**	0.116	0.040	0.107	-0.066	0.166*	-0.071	0.002	-0.002	0.068	0.007*
	(0.044)	(0.097)	(0.097)	(0.069)	(0.067)	(0.066)	(0.075)	(0.004)	(0.009)	(0.074)	(0.003)
Self-assessments	0.089**	0.123	0.073	0.019	-0.038	0.067	0.004	-0.000	0.006	0.017	0.001
	(0.034)	(0.069)	(0.058)	(0.034)	(0.023)	(0.040)	(0.033)	(0.001)	(0.004)	(0.033)	(0.001)
Lessons/Activities on Gender Issues	0.098*	-0.082	0.070	-0.002	-0.074*	-0.026	-0.022	0.001	0.003	-0.018	-0.000
	(0.041)	(0.047)	(0.076)	(0.044)	(0.034)	(0.039)	(0.044)	(0.002)	(0.006)	(0.040)	(0.002)
References to Diversity and Inclusion Issues	0.153**	-0.037	0.004	-0.015	-0.186**	0.104	0.055	0.005	0.006	-0.095	0.004
	(0.046)	(0.093)	(0.094)	(0.065)	(0.053)	(0.063)	(0.069)	(0.003)	(0.009)	(0.065)	(0.002)
References to Gender Issues	0.121**	0.019	-0.040	-0.039	-0.157**	0.057	0.061	0.001	-0.003	-0.034	-0.002
	(0.046)	(0.095)	(0.094)	(0.066)	(0.058)	(0.064)	(0.068)	(0.003)	(0.009)	(0.067)	(0.003)
References to Sports	-0.191**	0.017	-0.138	-0.092	-0.189**	0.048	0.207**	-0.002	-0.011	0.123	0.002
	(0.046)	(0.099)	(0.092)	(0.066)	(0.062)	(0.066)	(0.065)	(0.003)	(0.009)	(0.070)	(0.002)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

Materials N=572	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
Press Readings	0.114**	0.034	-0.013	-0.004	-0.112	0.127*	0.023	0.001	0.007	0.076	-0.001
	(0.044)	(0.093)	(0.090)	(0.065)	(0.060)	(0.059)	(0.067)	(0.003)	(0.009)	(0.068)	(0.002)
Literature Search of Research N=571											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
Library Holdings	0.097*	-0.098	-0.104	0.006	-0.048	0.069	0.008	0.006	0.005	-0.047	-0.001
	(0.045)	(0.095)	(0.092)	(0.065)	(0.062)	(0.061)	(0.067)	(0.003)	(0.009)	(0.071)	(0.002)
Internet Searches	0.106**	-0.033	0.020	0.057	0.021	0.058	-0.033	0.002	0.010	-0.028	0.001
	(0.039)	(0.092)	(0.083)	(0.059)	(0.058)	(0.057)	(0.068)	(0.003)	(0.009)	(0.068)	(0.003)
EconLit	0.197**	0.025	0.046	0.048	-0.059	0.186**	0.095	0.002	0.034**	0.086	0.000
	(0.047)	(0.096)	(0.092)	(0.065)	(0.057)	(0.062)	(0.069)	(0.003)	(0.008)	(0.068)	(0.002)
Grading N=579											
	Female	Lect./ Ins./Adj.	Asst. Prof.	Assoc. Prof.	ESL	Bacc.	Master	Proteach	Exp.	TT Load	Class Size: Other Upper
Shorter Papers	0.109*	0.083	-0.017	-0.067	-0.130*	0.160**	-0.002	0.006*	0.001	-0.001	-0.004
	(0.046)	(0.092)	(0.086)	(0.060)	(0.052)	(0.062)	(0.063)	(0.003)	(0.008)	(0.064)	(0.002)
Oral Presentations	0.129**	0.197*	0.070	0.015	-0.027	0.089	-0.125*	0.000	0.006	-0.058	-0.009**
	(0.046)	(0.090)	(0.090)	(0.063)	(0.061)	(0.063)	(0.063)	(0.003)	(0.009)	(0.068)	(0.002)
Class Participation	0.127**	-0.056	-0.028	-0.017	0.002	0.124*	0.104	-0.001	-0.008	-0.061	-0.003
	(0.046)	(0.090)	(0.091)	(0.064)	(0.062)	(0.063)	(0.068)	(0.003)	(0.009)	(0.072)	(0.003)

Table C.2 Probit Marginal Effects Estimates: Intermediate Theory; Statistics, Econometrics, and Math Economics; and Other Upper Division Courses, complete (continued)

Group Work	0.241**	0.053	0.098	0.061	0.021	0.11	-0.045	0.003	-0.003	0.036	0.005
	(0.044)	(0.097)	(0.091)	(0.066)	(0.063)	(0.066)	(0.068)	(0.003)	(0.009)	(0.068)	(0.003)
Multiple-choice Exams worth less than 50% of semester grade	0.043*	0.014	0.002	-0.020	0.007	0.015	-0.045	0.000	-0.005	-0.017	-0.004**
	(0.020)	(0.035)	(0.042)	(0.030)	(0.026)	(0.030)	(0.038)	(0.001)	(0.004)	(0.036)	(0.002)
Group work worth more than 10% of semester grade	0.236**	0.081	0.115	0.060	0.013	0.078	-0.046	0.001	0.003	0.047	0.003
	(0.045)	(0.095)	(0.089)	(0.063)	(0.060)	(0.064)	(0.064)	(0.003)	(0.008)	(0.065)	(0.003)

Standard errors in parentheses

* $p < .05$, ** $p < .01$

APPENDIX D

Chapter 6 Full Tables

Table D.1 Incentive and Time Allocation Variables by Rank

	Lecturer, Instructor, or Adjunct				Asst. Professor			
Variable	N	Median	Mean	SD	N	Median	Mean	SD
Proteach	109	5.00	19.65	(26.84)	208	40.00	31.80	(24.42)
Prorsch	110	0.00	26.02	(32.92)	208	40.00	38.88	(28.75)
Prosrv	111	0.00	9.78	(15.61)	208	10.00	10.95	(8.84)
Annteach	110	0.00	12.85	(23.30)	206	20.00	22.52	(24.71)
Annrsch	110	0.00	21.40	(32.71)	208	30.00	29.62	(30.97)
Annsrv	111	0.00	6.60	(13.91)	208	5.00	8.91	(10.82)
Wrkteach	110	80.00	71.18	(26.81)	207	50.00	52.78	(22.41)
Wrkrsch	110	0.00	5.77	(10.71)	207	25.00	27.93	(20.99)
Wrksrv	110	5.00	8.47	(10.75)	207	10.00	10.49	(9.27)
Dteach	110	70.00	66.89	(26.30)	207	40.00	43.47	(22.40)
Drsch	109	0.00	12.02	(15.50)	207	40.00	40.24	(24.76)
Dsrv	110	5.00	8.11	(9.85)	207	10.00	8.12	(8.15)

Table D.1 Incentive and Time Allocation Variables by Rank (continued)

	Assoc. Professor				Full Professor			
	N	Median	mean	SD	count	Median	mean	SD
Proteach	180	40.00	37.60	(22.12)	343	40.00	37.23	(21.51)
Prorsch	180	40.00	41.17	(25.46)	343	40.00	45.48	(25.80)
Prosrv	180	10.00	12.83	(9.34)	343	10.00	12.15	(8.55)
Annteach	177	25.00	26.50	(26.68)	342	30.00	25.94	(23.76)
Annrsch	178	30.00	32.39	(52.09)	343	40.00	37.68	(39.12)
Annsrv	179	5.00	8.82	(10.32)	342	10.00	10.95	(12.93)
Wrkteach	180	50.00	49.35	(20.63)	341	40.00	43.17	(21.85)
Wrkrsch	179	20.00	24.53	(18.92)	341	30.00	28.20	(19.46)
Wrksrv	180	10.00	12.53	(10.85)	340	10.00	11.21	(10.08)
Dteach	180	42.50	42.69	(22.78)	340	40.00	39.76	(24.36)
Drsch	180	35.00	36.83	(25.62)	340	40.00	37.68	(25.35)
Dsrv	180	10.00	7.83	(7.87)	341	5.00	7.53	(7.92)

Table D.2 Incentive and Time Allocation Variables: Baccalaureate Institutions

Variable	N	Median	Mean	SD
Proteach	191	50.00	48.14	(20.31)
Prorsch	191	30.00	29.99	(17.45)
Prosrv	191	10.00	14.02	(11.98)
Annteach	189	34.00	30.56	(28.81)
Annrsch	190	20.00	21.27	(22.65)
Annsrv	190	10.00	10.97	(14.41)
Wrkteach	191	60.00	57.98	(18.92)
Wrkrsch	190	20.00	20.56	(15.14)
Wrksrv	190	10.00	10.60	(7.92)
Dteach	191	50.00	51.80	(20.66)
Drsch	191	30.00	30.47	(20.93)
Dsrv	191	10.00	8.16	(7.60)

Table D.3 Incentive and Time Allocation Variables: Master's Institutions

Variable	N	Median	Mean	SD
Proteach	184	50.00	44.23	(22.86)
Prorsch	184	30.00	27.91	(19.06)
Prosrv	184	15.00	15.30	(9.72)
Annteach	183	10.00	25.35	(28.45)
Annrsch	183	0.00	17.00	(21.70)
Annsrv	183	0.00	9.22	(13.01)
Wrkteach	181	55.00	54.12	(22.21)
Wrkrsch	181	20.00	19.26	(16.08)
Wrksrv	181	10.00	11.46	(10.96)
Dteach	180	50.00	49.76	(24.83)
Drsch	181	25.00	27.07	(20.92)
Dsrv	181	10.00	8.64	(8.17)

Table D.4 Incentive and Time Allocation Variables: Doctoral Institutions

Variable	N	Median	Mean	SD
Proteach	473	20.00	22.72	(19.07)
Prorsch	474	50.00	50.74	(30.68)
Prosrv	475	10.00	9.28	(8.45)
Annteach	470	15.00	18.95	(19.23)
Annrsch	473	42.00	43.76	(47.06)
Annsrv	474	5.00	8.82	(10.56)
Wrkteach	474	40.00	45.05	(25.57)
Wrkrsch	474	30.00	28.31	(22.66)
Wrksrv	474	10.00	10.82	(10.54)
Dteach	474	35.00	38.80	(25.60)
Drsch	472	40.00	39.97	(27.95)
Dsrv	474	5.00	7.19	(8.23)

Table D.5 Incentive and Time Allocation Variables by Gender

	Female				Male			
Variable	N	Median	Mean	SD	N	Median	Mean	SD
Proteach	305	40.00	33.23	(23.91)	550	35.00	33.59	(23.85)
Prorsch	305	40.00	35.79	(26.89)	551	40.00	43.22	(28.68)
Prosrv	306	10.00	12.54	(11.12)	551	10.00	11.11	(9.23)
Annteach	300	5.00	20.95	(25.50)	549	20.00	24.73	(24.44)
Annrsch	302	10.00	25.85	(30.11)	551	40.00	36.20	(44.00)
Annsrv	304	0.00	8.35	(11.88)	550	10.00	9.95	(12.14)
Wrkteach	303	50.00	52.08	(24.03)	550	50.00	49.30	(24.44)
Wrkrsch	303	19.00	20.25	(18.13)	549	20.00	26.51	(21.11)
Wrksrv	302	10.00	12.14	(11.40)	550	10.00	10.20	(9.39)
Dteach	302	47.50	45.07	(24.78)	550	40.00	44.10	(25.68)
Drsch	303	30.00	29.96	(24.37)	548	40.00	37.29	(26.17)
Dsrv	303	10.00	9.33	(9.42)	550	5.00	6.89	(7.37)

Table D.6 Incentive and Time Allocation Variables by Rank, Female

Variable	Lecturer, Instructor, or Adjunct N	Median	Mean	SD	Asst. Professor N	Median	Mean	SD
Proteach	47	5.00	18.17	(25.10)	82	40.00	32.55	(23.70)
Prorsch	47	0.00	26.34	(32.05)	82	35.00	33.61	(26.08)
Prosrv	48	0.00	10.38	(17.50)	82	10.00	11.89	(9.95)
Annteach	47	0.00	10.85	(19.98)	81	0.00	19.23	(22.79)
Annrsch	47	0.00	21.70	(32.27)	82	10.00	25.52	(30.07)
Annsrv	48	0.00	5.62	(10.85)	82	0.00	8.28	(11.34)
Wrkteach	47	75.00	66.28	(29.11)	81	50.00	53.34	(20.52)
Wrkrsch	47	0.00	5.34	(9.85)	81	25.00	25.07	(19.16)
Wrksrv	47	5.00	9.70	(11.61)	81	10.00	11.74	(11.37)
Dteach	47	60.00	61.91	(24.99)	81	45.00	44.78	(20.81)
Drsch	47	5.00	13.30	(16.43)	81	40.00	38.33	(23.49)
Dsrv	47	10.00	10.53	(11.34)	81	10.00	9.14	(9.74)

Table D.6 Incentive and Time Allocation Variables by Rank, Female (continued)

Variable	Assoc. Professor N	Median	Mean	SD	Full Professor N	Median	Mean	SD
Proteach	79	40.00	39.93	(21.44)	89	40.00	36.72	(21.75)
Prorsch	79	40.00	40.01	(24.51)	89	40.00	39.40	(24.98)
Prosrv	79	10.00	13.74	(9.11)	89	10.00	13.76	(9.33)
Annteach	77	20.00	26.05	(28.22)	88	20.00	24.85	(26.94)
Annrsch	77	20.00	27.42	(30.37)	89	30.00	27.33	(28.66)
Annsrv	78	5.00	8.68	(10.61)	89	10.00	9.96	(13.96)
Wrkteach	79	50.00	50.06	(20.87)	88	45.00	45.34	(23.07)
Wrkrsch	79	20.00	22.92	(18.63)	88	20.00	22.24	(16.34)
Wrksrv	79	10.00	14.35	(12.91)	87	10.00	12.13	(9.69)
Dteach	79	45.00	42.03	(22.55)	87	40.00	40.03	(26.11)
Drsch	79	30.00	33.35	(25.33)	88	30.00	29.30	(23.89)
Dsrv	79	10.00	9.22	(8.50)	88	10.00	9.07	(8.89)

Table D.7 Incentive and Time Allocation Variables by Rank, Male

	Lecturer, Instructor, or Adjunct				Asst. Professor			
Variable	N	Median	Mean	SD	N	Median	Mean	SD
Proteach	60	5.00	21.47	(28.44)	123	35.00	31.63	(24.93)
Prorsch	61	0.00	26.62	(34.03)	123	40.00	42.24	(29.71)
Prosrv	61	0.00	9.64	(14.26)	123	10.00	10.52	(8.00)
Annteach	61	0.00	14.80	(25.84)	122	20.00	25.26	(25.77)
Annrsch	61	0.00	21.87	(33.61)	123	33.30	32.26	(30.89)
Annsrv	61	0.00	7.59	(16.11)	123	10.00	9.54	(10.51)
Wrkteach	61	80.00	75.82	(22.92)	123	50.00	52.55	(23.57)
Wrkrsch	61	0.00	6.30	(11.50)	123	25.00	29.63	(21.93)
Wrksrv	61	5.00	7.64	(10.18)	123	10.00	9.72	(7.65)
Dteach	61	75.00	71.27	(25.42)	123	40.00	42.73	(23.58)
Drsch	60	0.00	11.42	(14.93)	123	40.00	41.22	(25.72)
Dsrv	61	5.00	6.52	(8.26)	123	10.00	7.52	(6.94)

Table D.7 Incentive and Time Allocation Variables by Rank, Male (continued)

	Assoc. Professor				Full Professor			
Variable	N	Median	Mean	SD	N	Median	Mean	SD
Proteach	100	40.00	35.54	(22.56)	252	40.00	37.31	(21.52)
Prorsch	100	40.00	42.20	(26.37)	252	45.00	47.73	(25.85)
Prosrv	100	10.00	12.15	(9.55)	252	10.00	11.54	(8.19)
Annteach	99	30.00	27.11	(25.55)	252	30.00	26.32	(22.58)
Annrsch	100	30.00	36.54	(64.01)	252	40.00	41.47	(41.70)
Annsrv	100	7.50	9.02	(10.15)	251	10.00	11.35	(12.59)
Wrkteach	100	50.00	48.63	(20.57)	251	40.00	42.24	(21.35)
Wrkrsch	99	20.00	25.80	(19.23)	251	30.00	30.31	(20.12)
Wrksrv	100	10.00	11.11	(8.75)	251	10.00	10.90	(10.20)
Dteach	100	40.00	42.99	(23.07)	251	40.00	39.46	(23.73)
Drsch	100	40.00	39.69	(25.73)	250	40.00	40.70	(25.30)
Dsrv	100	5.00	6.71	(7.22)	251	5.00	7.01	(7.51)