

# Motivating College-Level Immersion: The AP Economics Programs and Exams\*

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## Abstract

Each year more than 190,000 students participate in the AP Economics programs. This report briefly explains the structure of the AP exams, how AP content is aligned with college courses, how the AP exams are developed, how student essays and graphs are graded, and what the results may reveal about strengths and weaknesses in pre-college economic education. The report also touches on professional development programs for high school teachers and past research on AP grades as a predictor of success in college.

\*Any opinions expressed here are solely those of the author, who is not an employee of the College Board or the Educational Testing Service.

## Introduction

I was introduced to economics by a great high school economics course. Now my career revolves around economics, as does yours. Because economic literacy improves lives, policies, and a broad range of decisions, we are justified in our focus on bringing economics to others. I would like to explain the AP Economics programs as a means of bringing economics to more young people. As the core of a high quality introduction to our field, the AP Microeconomics and AP Macroeconomics programs bring college-level courses to high school students.

Success in the AP Economics courses is evaluated with exams in microeconomics and macroeconomics. Each exam includes three free-response questions—one longer question and two shorter questions—each of which might include graphical analysis. The free-response section of the exam begins with a 10-minute reading period, and then students have 60 minutes to answer the questions. There is also a multiple-choice section for which students have 70 minutes to answer 60 questions.

In 2014, 74,049 students took the AP Microeconomics exam and 117,209 took the AP Macroeconomics exam. The pass rates were 66 percent for the AP Microeconomics exam and 58 percent for the AP Macroeconomics exam. Acceptance policies for AP scores at particular schools can be found at <https://apstudent.collegeboard.org/creditandplacement/search-credit-policies>. We will see from past research that success in an AP course contributes to success in college admissions, grades, and completion.

## Aligning the Exam with College Courses

The ability of AP courses to carry students into intermediate college courses comes from the careful design of the AP curriculum. The AP Economics courses deliberately mirror rigorous college economics courses. The alignment of the exam with college courses comes from a process of surveying college professors about their coverage and having college professors evaluate the AP curriculum. Beyond that, the development of the AP Exams is conducted by college and high school economics instructors who are well versed in the content of college textbooks and courses.

Guided by the AP Course Outline, economics instructors write questions for the AP exams in assigned content areas. These questions are taken up by the Test Development Committees for AP Microeconomics and AP Macroeconomics, which are also made up of high

school and college economics instructors. Greg Mankiw of Harvard University has served on the AP Economics Test Development Committee, as have professors from Duke University, Oberlin College, Davidson College, Wesleyan University, the U.S. Naval Academy, and other top academic institutions.

The Test Development Committees comb over each question many times over the course of several years during their meetings held three times annually. Each question is reviewed again by accuracy checkers and the chief readers in each field, all of whom are Ph.D. economists. There are differing domestic and international versions of the exams, and students who take the exams on alternate dates due to illness or some other conflict take different versions of the exams as well. Past microeconomics exams and rubrics can be viewed at:

[http://apcentral.collegeboard.com/apc/members/exam/exam\\_information/2084.html](http://apcentral.collegeboard.com/apc/members/exam/exam_information/2084.html).

Past macroeconomics exams are available at:

[http://apcentral.collegeboard.com/apc/members/exam/exam\\_information/2083.html](http://apcentral.collegeboard.com/apc/members/exam/exam_information/2083.html).

The rigor of the exams is high. When writing economics textbooks that could be used for AP Economics classes, this author is always challenged to include a good representation of the breadth and depth of material on the AP exams. That is to say, one shouldn't worry too much about teachers teaching to these exams, because the coverage on these exams is broader than the coverage of most rigorous college courses.

### Scoring the Exams

The free-response questions require students to draw graphs and provide written answers that are scored by economics instructors. The scores are determined on the basis of a detailed rubric. Partial credit is generally granted when possible. Graphs are scrutinized for correct axis labels, shapes of curves, shifts, and shading of areas that represent, for example, deadweight loss or profit. Most questions include one or more "Explain" items that require elaboration on the reasons for economic phenomena beyond illustrations on graphs. The questions go beyond testing memorized terms and models to assess whether students have a deep understanding of concepts and have learned to manipulate models.

The AP Reading is conducted by a mix of roughly half college economics professors and half high school AP Economics instructors. All of the chief readers have been college professors, and every Test Development Committee has been chaired or co-chaired by a college professor.

Staff members of the Educational Testing Service and the College Board do not take part in the grading of exams. The readers are diverse in terms of gender, race, and region, and come from schools that are public and private, including universities and liberal arts colleges as well as high schools. The readers have at least three years of experience teaching economics at the AP level. The AP Reading is selective in hiring—the supply of readers exceeds the demand—and most of the readers have previous experience reading the AP Economics exams.

### Accuracy Checks

Before the AP Reading begins, leaders go over a scoring rubric that allocates points for detailed elements of each graph and explanation. For example, for a monopoly graph, one point might be earned for drawing a downward-sloping demand curve, another for a marginal revenue curve that lies below the demand curve, and so on. Many questions involve both graphs and written explanations. A monopoly question might ask students to explain why the marginal revenue curve falls below the demand curve, and a point would be awarded for an explanation such as, “The marginal revenue curve lies below the demand curve because the monopolist must lower the price on all units in order to sell one more, and the loss of revenue from units that would have sold for a higher price brings the marginal revenue below the price.”

Readers then conduct “round robins” during which the same set of sample answers are graded by everyone assigned to grade a particular question. The scores from the readers are compared. When there are scoring differences across readers, there are further discussions of the rubric to achieve clarity about proper interpretation. These round robins continue with new test samples until the rubric is well understood and the scores of the readers converge.

Accuracy is checked during the reading in several ways. Days typically begin with a round robin to refresh readers on the rubric and verify alignment across readers. On a daily basis, leaders score the same exams as readers and compare the scores, following up on any differences. And readers are sometimes given the same exams twice to check for consistency with their own past scoring. Leaders also receive score reports that flag readers who are giving scores that are significantly higher or lower than average.

### Results

The raw score for each AP Economics exam is translated into a score between 1 and 5. The score-setting process involves adjustments to maintain the difficulty of achieving each final score, based partially on a subset of multiple-choice questions that carry over from one exam to

the next. The College Board considers a score of 3 passing. Some of the most selective colleges and universities require a score of 4 or even 5.

Of those taking the AP Microeconomics exam in 2014,

18.9% of students received a score of 1,  
15.5% received a 2,  
20.7% received a 3,  
28.9% received a 4, and  
15.9% received a 5.

Of those taking the AP Macroeconomics exam in 2014,

24.7% of students received a score of 1,  
17.5% received a 2,  
18.5% received a 3,  
23.2% received a 4, and  
16.1% received a 5.

The percentages are not fixed because the difficulty of the exam and the performance of students both vary from year to year, but the degree of variation is not great.

#### Areas of Success and Difficulty

Each year the chief readers of the AP Microeconomics and AP Macroeconomics Exams collect data on the most-missed topics to assist economics educators. The ten most problematic areas on the 2014 AP Microeconomics exam, in increasing order of difficulty, were:

- Showing the formula for calculating tax revenue
- Calculating profit for a monopolist that over-produces
- Calculating consumer surplus for a monopolist that over-produces
- Explaining that the marginal factor cost is equal to the equilibrium wage because firms in a perfectly competitive factor market are wage takers
- Illustrating that the supply curve is horizontal for a firm in a PC labor market
- Explaining that constant returns to scale occur when ATC is constant
- Determining that consumer surplus is zero if a monopolist perfectly price discriminates

- Explaining the relative relationship between supply and demand elasticities and tax burden
- Calculating deadweight loss if the monopolist over-produces
- Showing profit with perfect price discrimination

The ten most problematic areas on the 2014 AP Macroeconomics exams were:

- Identifying the linkage between real interest rates with long-run economic growth
- Calculating the maximum increase in real GDP given an MPC and an increase in government spending
- Identifying the appropriate open market operation when the Fed targets a lower federal funds rate
- Explaining what will happen to real GDP as the result of an increase in exports
- Showing the effect of a decrease in inflation in the United States on the foreign exchange market for the South Korean currency, the won
- Making calculations with the balanced budget multiplier
- Determining the effect of Fed purchases of bonds from commercial banks on the level of required reserves at those banks
- Defining the discount rate
- Comparing the government spending multiplier and the tax multiplier
- Explaining the process by which a decrease in the real interest rate affects long-run economic growth

Details on the most-missed questions for the past several years are available at

<http://web.centre.edu/econed/Pages/miscella.htm>.

#### Quality Enhancement for High School Classes

Among the challenges in offering a college-level economics course to high school students is quality control. High school economics teachers are often social studies generalists but not economics specialists. Yet the teachers chosen to teach AP courses tend to be the cream of the crop, and ambitious professional development efforts go a long way to bring them up to speed.

Before an AP course is approved, teachers must submit their syllabi and other materials to instructors hired by the College Board for vetting. Information on this AP Audit process is available at <http://www.collegeboard.com/html/apcourseaudit/>. Many resources are available to teachers to help them develop and teach an effective course. There is a moderated online

Teacher Community for each discipline that allows teachers to share questions and advice at no cost. The AP Central website (<http://apcentral.collegeboard.com/home>) provides a home page for each course that is filled with information for students and teachers. There are annual conferences put on by the College Board and the Federal Reserve that provide professional development activities for teachers. And each year teachers immerse themselves in about 45 AP Economics Summer Institutes that last several days and 30 AP Economics one-day workshops. These include programs offered publicly to any interested teacher, and programs offered privately by states, districts, or schools for their own teachers.

The AP Reading itself is in many ways a professional development event, with hundreds of instructors gathering for a week or so to discuss the finer points of economics. Many valuable conversations come out of the process of learning the rubric. The AP Readings also include lunchtime and evening meetings to discuss economic theory and pedagogy, and a professional night with guest speakers that have included Greg Mankiw, Paul Krugman, Charles Wheelan, Joel Waldfogel, David Colander, Stanley Brue, Russell Roberts, and other prominent economists.

#### AP Performance and Success in College

Studies that include Burnham and Hewitt, 1971; Dodd, Fitzpatrick, De Ayala, and Jennings, 2002; Morgan and Crone, 1993; and Morgan and Ramist, 1998, have found that students who pass an AP exam generally outperform other students in the subsequent courses they pass into, even after controlling for such measures of preparedness as standardized test scores and high school GPA. Willingham and Morris (1986) found that students who merely took an AP course—whether they passed the exam or not—were more likely to earn a B average in their first year of college than students who did not take an AP Exam. Dougherty, Mellor, and Jian (2006) found that students who passed at least one AP Exam in English, mathematics, science, or social studies were more likely to graduate from college within five years than students who did not. And students who scored a 1 or 2 on an AP Exam graduated at a higher rate than students who did not take an AP Exam. Again, the investigators controlled for academic ability among other student characteristics.

Mattern, Shaw, and Xiong (2009) found that students who passed an AP Exam in English Language, Biology, Calculus, or U.S. History outperformed other students in regard to their first-year college grade point average, retention to the second year, and institutional selectivity. Geiser and Santelices (2004) looked at students who took AP or honors courses and concluded

that participation in rigorous high school courses is not a useful predictor of college success, but performance on the AP Exam is. And Hargrove, Godin, and Dodd (2008) found that students who took both an AP course and the associated exam outperformed students who took the course but not the exam, or took neither, in terms of four-year graduation rates and first- and fourth-year college GPAs.

## Conclusions

The AP Microeconomics and AP Macroeconomics programs offer a rigorous introduction to the principles of economics to a growing number of ambitious high school students. Great efforts are made to match the AP curriculum with that of strong college programs, to prepare high school instructors to teach college-level classes, to write exams that gauge students' economic literacy, and to grade the exams accurately. Perhaps the most compelling evidence of the legitimacy of the AP Economics programs lies in the exams themselves. I encourage you to peruse the exams and rubrics online and judge the materials according to your own standards.

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