Student Performance Q&A:

2014 AP® Microeconomics Free-Response Questions

The following comments on the 2014 free-response questions for AP® Microeconomics were written by the Chief Reader, Pamela Schmitt of the United States Naval Academy, and Question Leaders Woodrow Hughes, David Burgin, and Michael Brody. They give an overview of each free-response question and of how students performed on the question, including typical student errors. General comments regarding the skills and content that students frequently have the most problems with are included. Some suggestions for improving student performance in these areas are also provided. Teachers are encouraged to attend a College Board workshop to learn strategies for improving student performance in specific areas.

Question 1

What was the intent of this question?

This question assesses the student's ability to work with the monopoly model under various circumstances. Part (a) tests for an understanding of how price and quantity are determined by a profit-maximizing, unregulated monopolist. The question also examines the student's ability to determine the allocatively efficient level of output in monopoly. Part (b) of the question asks to determine whether the monopolist is experiencing economies of scale and to explain the answer. In part (c), the student is required to calculate profit, consumer surplus, and the deadweight loss to society when the monopolist is producing a given (but not profit-maximizing) quantity of output. Part (d) of the question tests the student's understanding of the relationship between unitary elasticity and marginal revenue. In part (e), the question examines the student's ability to determine economic profit and consumer surplus under conditions of perfect price discrimination.

How well did students perform on this question?

The mean score was 4.66, which is approximately 47 percent of the maximum possible score of 10 points. Students performed well in identifying the profit-maximizing price and quantity as well as the allocatively efficient quantity.

What were common student errors or omissions?

The lowest-scoring part of this question was part (e), which asked the student to determine the economic profit and consumer surplus for a monopolist practicing perfect price discrimination. In the first part of (e), less than one-fifth of the students correctly determined the economic profit for the monopolist; in the second part, slightly less than one-fourth of the students correctly determined that consumer surplus was zero. Another common problem for the students was part (b), which asked the student if the monopolist is experiencing economies of scale and explain their answer. Many students correctly answered that the monopolist is not experiencing economies of scale, but were not able to explain their answer. Part (c) asked

students to calculate the economic profit, the consumer surplus, and the deadweight loss for the monopolist producing a given amount of output. Approximately one-fourth of students correctly responded to these questions. Part (d) asked the student to identify the quantity at which the price elasticity of demand was unit elastic. Only one-third of the students answered this question correctly.

Based on your experience of student responses at the AP® Reading, what message would you like to send to teachers that might help them to improve the performance of their students on the exam?

Part (b) required students to explain their assertion that the monopolist was not experiencing economies of scale. It takes a greater depth of understanding to explain concepts well than to simply make an assertion, read a diagram, or repeat a definition. Questions such as "What causes this to happen?" or "How does the definition apply in this case?" encourages the student to think conceptually, to understand relationships between variables, and to apply definitions to various situations. If the students know they will need to explain their answers in class, they will have a greater incentive to develop a firm understanding of the concepts and not just memorize formulas or definitions. The difference between memorization and understanding was particularly important in parts (b), (c), and (e). Part (b) asked the student to determine if the monopolist is experiencing economies of scale and explain her answer. The student was given a diagram with a horizontal LRATC curve where MC=ATC=LRATC. This presentation is not the customary U-shaped LRATC curve. The student should recognize that economies of scale are linked to the downward sloping portion of LRATC. In this case, the firm is not experiencing economies of scale because the LRATC is constant. Part (c) required students to show the calculations for economic profit, consumer surplus, and deadweight loss for the monopolist producing a given amount of output (10 units) and not the profit-maximizing level of output. The intent of the question was to test the student's knowledge of how these outcomes are determined. In part (e) (i), the student was asked for the profit earned by the monopolist, if the monopolist could perfectly price discriminate. The student must first know the definition for perfect price discrimination, apply the definition to the diagram, and then calculate the profit earned. Part (e)(ii) asks the student to determine consumer surplus for the monopolist under perfect price discrimination. In this case, the student must recognize that the perfect price discriminating monopolist will capture all benefits, leaving consumer surplus at zero. Classroom discussions of variations on the standard monopoly model will give students practice in manipulating the model and help them grasp its importance and versatility.

Question 2

What was the intent of this question?

This question assesses the student's ability to work with a perfectly competitive factor market. It tested the student's ability to draw a graph for the market and for the firm. The question then examined the student's understanding that the wage set in the market is equal to the wage paid by the firm because the firm has no control over the wage. The question also determined the student's knowledge that an effective minimum wage would be higher than the equilibrium wage. The minimum wage would result in a greater quantity supplied in the market and a higher marginal revenue product for the firm.

How well did students perform on this question?

The mean score was 2.74, which is approximately 46 percent of the maximum possible score of 6 points. Students performed well in drawing the market graph and recognizing that an effective minimum wage is above the equilibrium market wage.

What were common student errors or omissions?

The hardest parts of this question were part (a)(i), which asked the student to draw a firm graph, and part (b), which asked students to explain that the market wage and the firm wage are equal because the firm has no control over the wage. Less than one-fourth of the students correctly drew a firm graph in the labor market. Likewise, less than one-fourth of the students explained why the firm is a wage taker in a perfectly competitive factor market. Approximately half of the students failed to identify the quantity supplied derived from the supply curve, but rather identified the quantity supplied as being derived from the demand curve. Approximately two-thirds of the students failed to recognize that with a higher wage, the firm would have a higher marginal revenue product.

Based on your experience of student responses at the AP® Reading, what message would you like to send to teachers that might help them to improve the performance of their students on the exam?

Part (a)(ii) required the student to draw a firm graph in a perfectly competitive labor market. Many of the students who missed this point simply redrew the market graph they drew in (a)(i). In part (b), the student was required to explain why the market wage equals the wage the firm pays. Many students reiterated that the firm's wage equaled the market wage because it is perfectly competitive, but did not explain that the market sets the wage for the firm due to the fact the firm has no control over wages and/or is a wage taker. When the students are learning how to draw the factor market graphs, it is important to take the time to connect what the students already have learned about perfectly competitive product market to the factor market. If the student understands that in the product market, the market sets the price, it is a similar concept here with the only difference being that in the factor market, the price is the wage. While the students seem to be doing a good job memorizing how the graphs are drawn, teachers need to emphasize why the graphs look like they do.

For part (c)(ii), stressing that a supply curve is derived from the quantity supplied at each price will help the student realize that the quantity supplied can only come from a supply curve. Relating what the students already know about the demand curve should help them better comprehend the relationship between the quantity supplied and the supply curve.

Question 3

What was the intent of this question?

This question tests the student's ability to analyze the impact of a per-unit tax in a competitive market. The student is asked to draw a graph and show how the imposition of a per-unit tax impacts the quantity, the price paid by consumers, and the price received by sellers. The student is then asked to explain how the tax revenue collected by the government would be calculated. Finally, the student is asked to explain if the tax burden falls more on sellers or buyers, with given elasticities of supply and demand.

How well did students perform on this question?

The mean score was 3.26, which is approximately 54 percent of the maximum possible score of 6 points. Students performed well on part (a), which asked them to draw a graph for the gasoline market and show the equilibrium price and quantity before the imposition of a tax. Students also did well on part (b)(i), which asked them to identify the higher price paid by consumers after the tax and part (b)(ii), which asked students to show that, after the imposition of the tax, the quantity of gasoline sold in the market would decrease.

What were common student errors or omissions?

The students had the most difficulty answering part (d) correctly. While most responses correctly identified that the tax burden falls more on buyers than on sellers, they did not explain that this is the result of the demand curve being more inelastic than the supply curve. Instead, the students tended to focus on the inelasticity of demand only, rather than a comparison of elasticities of supply and demand. The next most common error was that the student incorrectly identified the price received by sellers after the imposition of the tax. This further lead the student to miss the point for explaining how to calculate the area of tax revenue collected by the government, as their equation identified an amount of tax revenue that did not correspond to the after-tax quantity sold.

Based on your experience of student responses at the AP® Reading, what message would you like to send to teachers that might help them to improve the performance of their students on the exam?

Showing the size of the per unit tax as the difference between what consumers pay and sellers receive was a challenging part of this question. While many of the students could identify that the tax burden would be on both buyers and sellers (more on buyers) in part (d), this was not often illustrated correctly on the student's graph. The most common error was to equate the change in market price to the full amount of the per unit tax, which is only true when demand is perfectly inelastic. It is a good practice for the students to have to both show and explain concepts as they go through material to deepen their understanding of the topics.

Explaining how to calculate an area is not the same as showing an area on a graph. When the exam prompts a student to "calculate" the tax revenue, students should use a formula, not shade an area on the graph or refer to labeled vertices of an area on a graph. Also, many students had clearly memorized a formula for the tax collected, but their formula was not correct given their labeling of their graph. Teachers should have students work through a variety of these types of problems, changing the elasticities of the curves and using different labeling to improve student understanding.