# Chief Reader Report on Student Responses:

## 2021 AP® Macroeconomics Free-Response Questions

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| • Number of Students Scored | 124,436 | | |
| • Number of Readers | 285 | | |
| • Score Distribution | Exam Score | N | %At |
| | 5 | 22,416 | 18.0 |
| | 4 | 24,369 | 19.6 |
| | 3 | 17,101 | 13.7 |
| | 2 | 19,558 | 15.7 |
| | 1 | 40,992 | 32.9 |
| • Global Mean | 2.74 | | |

The following comments on the 2021 free-response questions for AP® Macroeconomics were written by the Chief Reader, Sam Andoh, Professor of Economics, Southern Connecticut State University; Assistant Chief Reader, Holly Jones, The Pennington School; Question Leader, Nasrin Shahinpoor, Hanover College; and Stephanie Vanderford, Providence Day School. 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 preparation 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.

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| **Question #1** | **Task:** Graph, Assert, and Explain | **Topic:** Deviation from Full-Employment Output, Stabilization Policies, Foreign Exchange Effects |
| | **Max. Points:** 10 | **Mean Score:** 4.48 |

***What were the responses to this question expected to demonstrate?***

The question examined students' understanding of the aggregate demand/aggregate supply (AD/AS) in an inflationary gap in Smithland and the link to fiscal and monetary policies; the natural rate of unemployment and the nominal interest rate; and the effect of the policies on the foreign exchange market. Part (a) required students to identify the short-run aggregate demand, the long-run aggregate supply and the aggregate demand curves in a graph, show the current equilibrium real output, the price level, and the full-employment output level. In part (b) students were asked to assume that the government in Smithland cuts individual income taxes and to show and label the short-run effects on equilibrium real output in the graph in part (a). In part (c), based solely on the change in real output in part (b), students were asked to indicate what will happen to the natural rate of unemployment in the short run and what will happen to the nominal interest rate, then explain why the nominal interest rate changed. In part (d) students were asked to assume instead that the central bank intervenes to correct the inflationary output gap and indicate what open-market operation action the central bank will take. In part (e) students were asked to draw a correctly labelled graph of the money market and show the effect of the open market operation identified in part (d) on the nominal interest rate. Part (f) required students to use the effect on interest rate identified in part (e) to show and explain what will happen to the international value of Smithland's currency in the foreign exchange market. Finally, in part (g), based solely on the change in the foreign exchange rate identified in part (f), students were asked to indicate and explain whether the hypothetical economy's imports will increase, decrease, or stay the same.

***How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?***

Part (a) had two points. Seventy eight percent (78.2%) of students earned the first point by drawing a correctly labeled graph of the AD/AS model showing a downward sloping short-run aggregate demand curve, an upward sloping short-run aggregate supply curve, and a vertical long-run aggregate supply curve, and labeling the current equilibrium real output, $Y_1$ on the horizontal axis, and the current price level, $PL_1$ on the vertical axis. The second point was earned by 64.2% of students who correctly labeled the full-employment output, $Y_F$, on the horizontal axis and to the left of the current equilibrium.

In part (b) 60.1% of students earned the point by correctly drawing an aggregate demand curve to the right of the aggregate demand curve in part (a) and showing a new short-run equilibrium real output, $Y_2$, on the vertical axis to the right of $Y_1$.

Part (c) had two points. In (c)(i) 40.2% of students earned the point by asserting that as a result of the tax cut in part (b) the natural rate of unemployment will not change. In part (c)(ii) 12.8% of students earned the point by stating that as a result of the tax cut, nominal interest rates will increase and explaining that this was because the increase in real output will increase the demand for money.

In part (d) 56.8% of students correctly asserted that if the central bank intervened to correct the inflationary gap, it should sell bonds.

Part (e) had two points. For the first point, 54.5% of students drew a correctly labeled graph of the money market, and for the second point, 48.6% of students correctly shifted the money supply curve to the left and showed an increase in the nominal interest rate.

In part (f) 18.0% of students earned the point by correctly asserting that Smithland's currency will appreciate and explaining that there will be financial capital inflows as foreign investors seek higher returns in Smithland, which will increase the demand for Smithland's currency or decrease the supply of Smithland's currency.

Finally, in part (g), 36.9% of students earned the point by correctly asserting that based solely on the change in the exchange rate in part (f), Smithland's imports will increase and explaining that this is because the appreciation of Smithland's currency means that foreign goods will be relatively less expensive.

Generally, when students were asked to make assertions, they earned the point; when the assertion was coupled with an explanation, the point became difficult to earn. Such were the cases in (c)(ii) when 12.8% earned the point, in (f) when 18% earned the point, and in (g) when 36.9% earned the point.

***What common student misconceptions or gaps in knowledge were seen in the responses to this question?***

| *Common Misconceptions/Knowledge Gaps* | *Responses that Demonstrate Understanding* |
|---|---|
| Part (a)<br>• Incorrect labeling, reversing the axes<br>• Incorrectly positioning the LRAS to show the output gap | • Drawing a correctly labeled aggregate demand-aggregate supply graph that shows $PL_1$ and $Y_1$ at the intersection of AD and SRAS<br>• Showing a vertical LRAS curve to the left of $Y_1$ and labeling the full employment output $Y_F$ |
| Part (b)<br>• Showing a shift of the SRAS curve rather than a shift of the AD curve | • Showing the impact of the government's action with a rightward shift of the AD curve and an increase in short-run equilibrium real output labeled $Y_2$ |
| Part (c)<br>• Inability to distinguish between the factors that change cyclical unemployment and those that change the natural rate of unemployment<br>• Incorrectly concluding that a change in real output will lead to a change in the money supply, rather than a change in the demand for money | • Stating that the natural rate of unemployment will not change<br>• Stating that nominal interest rates will increase and explaining that this is because the increase in real output will increase the demand for money |
| Part (d)<br>• Not knowing exactly what an open market operation is | • Stating that the central bank should sell bonds |
| Part (e)<br>• Reversing the axes on the money market graph | • Drawing a correctly labeled graph of the money market<br>• Showing a leftward shift in the money supply curve, resulting in a higher nominal interest rate |

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| • Not labeling the vertical axis as the nominal interest rate<br><br>• Not recognizing that open market operations will shift the money supply curve | |
| Part (f)<br><br>• Providing an incomplete explanation of the link between the change in the interest rate, financial capital flows, and currency appreciation | • Stating that Smithland's currency will appreciate and explaining that this is because there will be financial capital inflows as foreign investors seek higher returns in Smithland, which will increase the demand for Smithland's currency or decrease the supply of Smithland's currency |
| Part (g)<br><br>• Not explaining that the change in net exports is the result of the change in the relative prices of domestic and foreign goods | • Stating that Smithland's imports will increase and explaining that this is because the appreciation of Smithland's currency means that foreign goods will be relatively less expensive |

***Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?***

Emphasize the chain of causation behind any change, e.g., government expenditure increases, aggregate demand increases, real output increases in the short run, demand for money increases given the money supply, and the nominal interest rate increases. This will help in exposing faulty reasoning allowing for it to be corrected at an early stage. It also helps to develop students' analytical skills.

Students should understand that in the money market, it is the nominal interest rate that determines the demand for money, and that it is the nominal interest rate on the vertical axis, not the real interest rate. It might help to emphasize to students that the opportunity cost of holding money is both the *real interest rate* foregone and the decrease in the value of money as a result of *inflation*, hence the nominal interest rate.

***What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?***

We would recommend that teachers take advantage of the resources available in AP Classroom for the topics and skills covered in this question. AP Daily videos can be assigned to students as warm-ups, lectures, or reviews, and Topic Questions and past AP Exam questions from the Question Bank can be assigned to assess student understanding.

**Question #2** | **Task:** Graph, Calculate, and Explain | **Topic:** The Phillips Curve, Multipliers, and Long-Run Adjustment

**Max. Points:** 5 | **Mean Score:** 1.92

***What were the responses to this question expected to demonstrate?***

The question examined students' understanding of how fiscal policy can be used to eliminate a recessionary output gap and how in the absence of intervention, the economy transitions to the long-run equilibrium. In part (a) students were asked to identify the economy's location on the short-run and long-run Phillips curve graph when there is a recessionary gap of $600 billion. In part (b)(i), given a marginal propensity to consume of .75, students were asked to calculate the minimum change in government spending needed to increase aggregate demand by the output gap of $600 billion and show their work. In part (b)(ii) students were asked to assume that instead of a change in government spending, the government changes taxes to accomplish the same change in aggregate demand. In part (c) students were asked to assume that the government takes no policy action to close the output gap shown in part (a) and to explain how the economy will adjust in the long run.

***How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?***

In part (a) 43.40% of students earned the first point by drawing a correctly labeled graph of the short-run Phillips curve; 31.94% of students earned the second point by including the long-run Phillips curve in the same graph and placing the point X, the short-run equilibrium, on the short-run Phillips curve to the right of the long-run Phillips curve.

In part (b)(i) 23.26% of students correctly calculated the minimum change in government spending required to increase aggregate demand by the amount of the output gap and showed their work. In part (b)(ii) 19.44% of students correctly calculated the minimum change in taxes required to increase aggregate demand by the amount of the output gap and showed their work.

Finally, in part (c), 42.72% of students correctly explained that if the government took no policy action to eliminate the gap, the short-run aggregate supply curve would increase due to a decrease in nominal wages, input prices, or inflationary expectations.

***What common student misconceptions or gaps in knowledge were seen in the responses to this question?***

| *Common Misconceptions/Knowledge Gaps* | *Responses that Demonstrate Understanding* |
|---|---|
| Part (a)<br>• Incorrect labeling<br>• Improper placement of the curves or point X to show that the economy is in a recession | • Drawing a correctly labeled graph of the SRPC<br>• Including a correctly labeled LRPC and showing point X on the SRPC to the right of the LRPC |
| Part (b)<br>• Incorrect calculations | • Correctly calculating the minimum change in government spending as an increase of $150 billion and showing correct work, which includes the calculation of the spending multiplier |

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| • Not properly showing work for the calculation | • Correctly calculating the minimum change in taxes as a decrease of \$200 billion and showing correct work, which includes the calculation of the tax multiplier |
| Part (c)<br>• Not explaining that the increase in the SRAS in the long run is due to a decrease in nominal wages, input prices, or inflationary expectations | • Explaining that SRAS will increase in the long run due to a decrease in nominal wages, input prices, or inflationary expectations |

***Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?***

Students commonly missed points that required an explanation or calculations. Teachers should emphasize the reasoning behind changes and go through the complete chain of causation; classroom simulations may be helpful in building student understanding. Teachers should also work with their students to model answering calculation questions by fully showing their work.

***What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?***

We would recommend that teachers take advantage of the resources available in AP Classroom for the topics and skills covered in this question. AP Daily videos can be assigned to students as warm-ups, lectures, or reviews, and Topic Questions and past AP Exam questions from the Question Bank can be assigned to assess student understanding.

**Question #3** | **Task:** Assert and Explain | **Topic:** Automatic Stabilizers, Government Budget and Debt

**Max. Points:** 5 | **Mean Score:** 2.02

***What were the responses to this question expected to demonstrate?***

The question examined students understanding of the effects of government fiscal policy actions on the government's budget and debt and its effect on unemployment in the short run. Students were told that the budget of Geeland, which is composed of tax revenues (T), transfer payments (TR) and government spending is currently balanced. In part (a) students were told to assume that Geeland moves into a recession, and there is no discretionary policy action taken. In part (a)(i) students were asked whether the government's budget deficit will move into a deficit or a surplus in the short-run and to explain using the appropriate components of the government budget. In part (a)(ii) students were asked what will happen to the government debt based on their response in (a)(i). In part (b), based on their answer in part (a)(i), students were asked to identify one fiscal policy action that will balance the budget. In part (c) students were asked how the fiscal policy action from part (b) will affect the actual unemployment rate in the short run and then explain. Finally, in part (d), students were asked to indicate if the government's efforts to maintain a balanced budget made the recession more or less severe in the short run and to explain why.

***How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?***

In part (a)(i) 40.81% of students correctly asserted that the government budget would move into a deficit if it was initially balanced and explained using the appropriate components. In part (a)(ii) 85.19% of students correctly stated that as a result of the deficit, government debt will increase.

In part (b) 55.41% of students correctly stated an increase in taxes or a decrease in government spending as one specific fiscal policy action that will balance the budget.

In part (c) 16.74% of students correctly asserted that the fiscal policy action indicated in part (b) will increase the unemployment rate and explained that the policy action will decrease aggregate demand and reduce real output in the short run.

In part (d) 33.40% correctly answered that the government's efforts to maintain a balanced budget made Geeland's recession more severe in the short run and explained that in order to maintain a balanced budget, the government implemented a contractionary fiscal policy during a recession.

***What common student misconceptions or gaps in knowledge were seen in the responses to this question?***

| *Common Misconceptions/Knowledge Gaps* | *Responses that Demonstrate Understanding* |
|---|---|
| Part (a)<br>• Incorrectly explaining the effect of automatic stabilizers on the government budget | • Stating that the government budget will move into deficit in the short run and explaining that tax revenues (T) will decrease and transfer payments (TR) will increase<br><br>• Stating that the government debt will increase |

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| • Some confusion between deficit and debt | |
| Part (b)<br>• Identifying an action that is not a *fiscal* policy | • Identifying an increase in taxes or a decrease in government spending |
| Part (c)<br>• Not explaining that the decrease in aggregate demand caused by the fiscal policy action causes a decrease in output and an increase in unemployment in the short run | • Stating that the unemployment rate will increase in the short run and explaining that aggregate demand will decrease, which will decrease real output |
| Part (d)<br>• Not understanding that balancing the budget during a recession is equivalent to conducting a contractionary fiscal policy | • Stating that the recession is made more severe in the short run by the government's efforts to balance the budget during a recession and explaining that in order to maintain a balanced budget, the government had to implement contractionary fiscal policy |

***Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?***

As mentioned previously, students tended to do well with assertion points but had more trouble with explanation points. Teachers should model full explanations in class and provide opportunities for student practice with feedback.

***What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?***

We would recommend that teachers take advantage of the resources available in AP Classroom for the topics and skills covered in this question. AP Daily videos can be assigned to students as warm-ups, lectures, or reviews, and Topic Questions and past AP Exam questions from the Question Bank can be assigned to assess student understanding.