

## Chief Reader Report on Student Responses: 2022 AP<sup>®</sup> Macroeconomics Set 1 Free-Response Questions

• Number of Students Scored	134,413		
• Number of Readers	203		
• Score Distribution	Exam Score	N	%At
	5	21,990	16.4
	4	26,860	20.0
	3	20,732	15.4
	2	20,330	15.1
	1	44,501	33.1
• Global Mean	2.71		

The following comments on the 2022 free-response questions for AP<sup>®</sup> Macroeconomics were written by the Chief Reader, Samuel Andoh, Professor of Economics, Southern Connecticut State University. 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.

## Question 1

**Task:** Graph, Assert, Calculate, and Explain

**Topic:** Output Gap in the AD–AS Model, Fiscal Policy, Effects of Investment Spending, Loanable Funds Market

**Max Score:** 10

**Mean Score:** 4.78

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

The question examined students' understanding of the aggregate demand–aggregate supply (AD–AS) model in a recessionary gap and the fiscal policy action that can be pursued to restore full employment; the effects of a change in investment spending; the natural rate of unemployment; and the effects of a change in private savings. Part (a) required students to draw a correctly labeled graph of aggregate demand, short-run aggregate supply, and long-run aggregate supply, and show the current equilibrium and the full-employment output. In part (b) students were asked to identify one fiscal policy action the country's government can take to restore full employment. In part (c) students were asked to assume instead that no fiscal policy action is taken and to calculate the minimum change in investment spending that could have caused a given increase in real GDP. In part (d) students were asked to show the short-run effect of the change in investment spending identified in part (c) on their AD–AS graph. In part (e) students were asked to identify and explain, given their answer to part (d), whether the actual rate of unemployment is greater than, less than, or equal to the natural rate of unemployment. In part (f) students were asked to assume that private savings now increase and to draw a correctly labeled graph of the loanable funds market showing the effect of the increase in private savings on the real interest rate. Finally, in part (g) based solely on the change in the real interest rate shown in part (f), students were asked to identify and explain what will happen to real GDP in the short run and to long-run aggregate supply.

***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. Eighty percent of students earned the first point by drawing a correctly labeled AD–AS graph showing  $PL_1$  and  $Y_1$  at the intersection of the AD and SRAS curves. Seventy-one percent of the students earned the second point by showing a vertical long-run aggregate supply curve to the right of  $Y_1$  and labeling it  $Y_F$ .

In part (b) 76% of students earned the point by correctly stating that the government can increase spending, decrease taxes, or increase transfer payments.

In part (c) 50% of students earned the point by correctly calculating the minimum change in investment spending as \$50 billion and showing their work.

In part (d) 46% of students correctly showed the short-run effect of the change in investment spending as a rightward shift of the aggregate demand curve, resulting in a higher equilibrium price level and higher equilibrium real output that is less than full-employment output, labeled  $PL_2$  and  $Y_2$  respectively.

In part (e) 50% of students correctly stated that the actual unemployment rate is greater than the natural rate of unemployment and explained that the economy is still experiencing a recessionary gap.

Part (f) had two points. Fifty-six percent of students earned the first point by drawing a correctly labeled graph of the loanable funds market, and 39% earned the second point by correctly shifting the supply of loanable funds curve to the right and showing a decrease in the equilibrium real interest rate.

Part (g) had two points. Forty-two percent of students earned the point in (g)(i) by stating that real GDP will increase in the short run and explaining that interest-sensitive spending (investment, consumption, or net exports) will increase, which will increase aggregate demand. Thirteen percent of students earned the point in (g)(ii) by stating that long-run aggregate supply will increase and explaining that the decrease in the real interest rate means the cost of borrowing has decreased which increases investment spending on plant and equipment and increases capital formation, which will increase potential output.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
Part (a) <ul style="list-style-type: none"> <li>• Incorrect labeling</li> <li>• Incorrectly positioning the LRAS curve to show the output gap</li> </ul>	<ul style="list-style-type: none"> <li>• Drawing a correctly labeled aggregate demand–aggregate supply graph that shows <math>PL_1</math> and <math>Y_1</math> at the intersection of AD and SRAS</li> <li>• Showing a vertical LRAS curve to the right of <math>Y_1</math> and labeling the full-employment output <math>Y_F</math></li> </ul>
Part (b) <ul style="list-style-type: none"> <li>• Identifying an action that is not a fiscal policy</li> </ul>	<ul style="list-style-type: none"> <li>• Stating an increase in government spending, a decrease in taxes, or an increase in transfer payments</li> </ul>
Part (c) <ul style="list-style-type: none"> <li>• Incorrect calculations</li> <li>• Not properly showing work for the calculation</li> </ul>	<ul style="list-style-type: none"> <li>• Calculating the minimum change in investment spending as \$50 billion and showing the work</li> </ul>
Part (d) <ul style="list-style-type: none"> <li>• Showing a shift in the SRAS curve rather than a shift of the AD curve</li> </ul>	<ul style="list-style-type: none"> <li>• Showing the short-run effect of the change in investment spending as a rightward shift of the aggregate demand curve, resulting in a higher equilibrium price level and higher equilibrium real output that is less than full-employment output, labeled <math>PL_2</math> and <math>Y_2</math> respectively</li> </ul>

<p>Part (e)</p> <ul style="list-style-type: none"> <li>• Inability to locate and compare the current equilibrium real output in relation to the full-employment output</li> <li>• Incorrectly concluding that the actual rate of unemployment is less than the natural rate of unemployment when output is less than full-employment output</li> </ul>	<ul style="list-style-type: none"> <li>• Stating that the actual unemployment rate is greater than the natural rate of unemployment and explaining that the economy is still experiencing a recessionary gap</li> </ul>
<p>Part (f)</p> <ul style="list-style-type: none"> <li>• Showing a shift of the demand for loanable funds curve rather than a shift of the supply of loanable funds curve or shifting the supply of loanable funds curve to the left rather than to the right</li> </ul>	<ul style="list-style-type: none"> <li>• Drawing a correctly labeled graph of the loanable funds market</li> <li>• Shifting the supply of loanable funds curve to the right and showing a decrease in the equilibrium real interest rate</li> </ul>
<p>Part (g)</p> <ul style="list-style-type: none"> <li>• Not providing the reason for the increase in AD as an increase in interest-sensitive spending</li> <li>• Providing an incomplete explanation of the chain of causation between the change in the real interest rate and the change in long-run aggregate supply</li> </ul>	<ul style="list-style-type: none"> <li>• Stating that real GDP will increase in the short run and explaining that interest-sensitive spending (investment, consumption, or net exports) will increase, which will increase aggregate demand</li> <li>• Stating that long-run aggregate supply will increase and explaining that the decrease in the real interest rate means the cost of borrowing has decreased which increases investment spending on plant and equipment and increases capital formation, which will increase potential output</li> </ul>

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

The most commonly missed point on this question was point (g)(ii) which asked students to identify and explain what will happen to long-run aggregate supply as a result of a decrease in the real interest rate. Responses often did not make the connection between the increase in investment spending and an increase in capital formation that makes the change in potential real output possible. Emphasize the chain of causation behind any change as in (g)(ii). This will help in exposing faulty reasoning and enable this misunderstanding to be corrected at an early stage. It also helps students to develop their analytical skills.

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

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available on the Classroom Resources section of the AP Macroeconomics course page.

## Question 2

**Task:** Calculate, Graph, Explain, Assert

**Topic:** Open Market Operations, Monetary Transmission Mechanism

**Max Score:** 5

**Mean Score:** 2.22

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

The question examined students' understanding of open market operations, the effect of a change in the monetary base on the money supply, and how changes in the money supply affect the nominal interest rate, nominal GDP, and the price level. In part (a) students were asked to calculate the maximum change and state the direction of change in the money supply as a result of a central bank bond sale and to show their work. In part (b) students were asked to draw a correctly labeled graph of the money market and show the effect of the change in the money supply identified in part (a) on the nominal interest rate. In part (c) students were asked to identify and explain what will happen to the nominal gross domestic product as a result of the change in the money supply. Finally, in part (d) students were asked to identify what happens to the price level, based on the change in the nominal gross domestic product in part (c), if the real gross domestic product is constant.

***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) 31% of students earned the point by correctly calculating the maximum change in the money supply as a decrease of \$500,000 and showing the work.

Part (b) had two points. Fifty-five percent of students earned the first point by drawing a correctly labeled graph of the money market, and 63% of students earned the second point by correctly shifting the money supply curve to the left, resulting in an increase in the nominal interest rate.

In part (c) 36% of students earned the point by stating that nominal gross domestic product will decrease and explaining that according to the quantity theory of money ( $MV=PY$ ), a decrease in the money supply will decrease nominal gross domestic product if velocity is constant.

In part (d) 55% of students earned the point by correctly stating that the price level will decrease.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
<p>Part (a)</p> <ul style="list-style-type: none"> <li>Incorrect calculations, in particular treating the central bank bond sale as a checkable deposit (rather than a change in the monetary base), resulting in a calculation of the change in the money supply as \$400,000</li> <li>Treating the bond sale as a purchase rather than a sale and therefore indicating a positive change in the money supply</li> </ul>	<ul style="list-style-type: none"> <li>Calculating the maximum change in the money supply as a decrease of \$500,000 and showing the work</li> </ul>
<p>Part (b)</p> <ul style="list-style-type: none"> <li>Incorrect labeling of the axes, confusing the money market with the goods market</li> </ul>	<ul style="list-style-type: none"> <li>Drawing a correctly labeled graph of the money market</li> <li>Showing a leftward shift in the money supply curve, resulting in an increase in the nominal interest rate</li> </ul>
<p>Part (c)</p> <ul style="list-style-type: none"> <li>Not knowing the quantity theory of money (<math>MV=PY</math>) so being unable to explain why <math>PY</math> will decrease if <math>M</math> does</li> </ul>	<ul style="list-style-type: none"> <li>Stating that nominal gross domestic product will decrease and explaining that according to the quantity theory of money (<math>MV=PY</math>), a decrease in the money supply will decrease nominal gross domestic product if velocity is constant</li> </ul>
<p>Part (d)</p> <ul style="list-style-type: none"> <li>Including an explanation that contradicts the assertion</li> </ul>	<ul style="list-style-type: none"> <li>Stating that the price level will decrease</li> </ul>

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

In general students are more likely to miss points when they have to justify their response with an explanation or by showing work. Teachers should emphasize the reasoning behind changes and provide opportunities for student practice as much as possible. In covering the quantity theory of money, for example, have students play with data, made up or real, to expand their understanding of the processes at work. Encourage students to label diagrams properly and to show what has happened with directional arrows.

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

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available on the Classroom Resources section of the AP Macroeconomics course page.

### Question 3

**Task:** Calculate, Assert, Graph, Explain

**Topic:** Foreign Exchange Market: Real Interest Rates, Financial Capital Flows, Exchange Rates, and Net Exports

**Max Score:** 5

**Mean Score:** 2.09

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

The question examines students' understanding of the foreign exchange market and how changes in the real interest rate affect financial capital flows, the value of the currency, and net exports. In part (a) students were asked to find the price of an Italian coat in yen, given the exchange rate between the euro and the yen and the cost of the coat in euros. In part (b) students were asked to identify what will happen to net financial capital flows between Italy and Japan if real interest rates increase in Japan. In part (c) students were asked to draw a correctly labeled graph of the foreign exchange market for the yen and show the effect of the increase in real interest rates in Japan on the value of the yen. Finally, in part (d) students were asked to identify and explain what will happen to Italy's exports to Japan as a result of the change in the value of the yen.

***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) 89% of students earned the point by identifying the price of the coat as 12,000 yen.

In part (b) 42% of students correctly stated that net financial capital flows from Italy to Japan will increase.

Part (c) had two points. Forty-three percent of students earned the first point by drawing a correctly labeled graph of the foreign exchange market for the Japanese yen, and 39% of students earned the second point by either shifting the demand curve for the yen to the right or the supply curve of the yen to the left, showing an appreciation of the yen.

In part (d) 16% of students earned the point by stating that Italy's exports will increase and explaining that the appreciation of the yen makes Italian goods relatively less expensive than Japanese goods or Japanese goods relatively more expensive than Italian goods.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
Part (a) <ul style="list-style-type: none"> <li>A few misplaced zeros: 1,200 yen instead of 12,000 yen</li> </ul>	<ul style="list-style-type: none"> <li>Stating that the price of the coat is 12,000 yen</li> </ul>
Part (b) <ul style="list-style-type: none"> <li>Not specifying the direction of financial capital flows (i.e., not specifying from Italy to Japan)</li> </ul>	<ul style="list-style-type: none"> <li>Stating that net financial capital flows from Italy to Japan will increase</li> </ul>
Part (c) <ul style="list-style-type: none"> <li>Incorrect vertical axis labeling</li> </ul>	<ul style="list-style-type: none"> <li>Drawing a correctly labeled graph of the foreign exchange market for the Japanese yen</li> <li>Showing a rightward shift of the demand curve for yen or a leftward shift in the supply curve of yen, resulting in an appreciation of the yen</li> </ul>
Part (d) <ul style="list-style-type: none"> <li>Difficulty in explaining that exports increase because Italian goods become <i>relatively</i> cheaper</li> </ul>	<ul style="list-style-type: none"> <li>Stating that Italy’s exports will increase and explaining that the appreciation of the yen makes Italian goods relatively less expensive than Japanese goods or Japanese goods relatively more expensive than Italian goods</li> </ul>

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

Students do much better on assertion points than they do on explanation points. Provide more opportunities for students to explain the results.

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

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. A longer faculty lecture on Unit 6 is also available on AP Classroom, which discusses the determination of exchange rates, changes in equilibrium exchange rates, and the balance of payments. AP teachers can use questions from the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available on the Classroom Resources section of the AP Macroeconomics course page.