Extra Credit a newsletter for educators

Macro Graphs: Using Manipulatives and Technology to Review Macro Models

Lesson by
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Lesson description

This lesson provides a hands-on approach to reviewing the key macroeconomics graphs and their determinants found in advanced high school economics courses and intro level college courses. Use manipulatives to review the aggregate demand and aggregate supply model, the money market model, and the loanable funds market model. Working in small groups, students will match elements of the models and determinants of the curves to their correct descriptions and then sort the terms into a graphic organizer, including labeling the model graph. After the graphic organizer is complete and correct, teachers can direct students to use the free version of www.goformative.com to shift the curves of the model using the "Show Your Work" feature of the online application.

Concepts

Price level	Real gross domestic product	Aggregate demand
Nominal interest rate	Money supply	Quantity of money
Aggregate supply	Equilibrium	Quantity of loanable funds
Money demand	Real interest rate	Supply of loanable funds
Demand for loanable funds	Determinants of money supply	Determinants of money demand
Determinants of aggregate supply	Determinants of aggregate demand	Determinants of the supply of loanable funds
Determinants of the demand for loanable funds		

Objectives

Students will be able to:

1. Define key terms, labels, and determinants associated with the money market, loanable funds market, and aggregate demand and supply model graphs.

2. Create three graphs associated with the study of macroeconomics including the money market, loanable funds market, and aggregate demand and supply model graphs.

3. Analyze changes in economic conditions in order to show correct curve shifts in the three macroeconomic model graphs.

4. Explain how changes in economic conditions affect macroeconomic variables such as price level, real gross domestic product, nominal interest rates, the quantity of money, real interest rates, and the quantity of loanable funds.

5. Define price floors and apply that knowledge to the minimum wage debate.

6. Compare the cost of living across various geographical regions as it relates to the minimum wage.

7. Recognize the role that education plays in determining wages.

Related Content
Economics, AP Economics, Macroeconomics

Time required
Each of the three model graph activities will take 30 minutes; teachers will most likely conduct these activities on different days after teaching each model.

Materials

Presentation with the slides for the model you are reviewing

Aggregate demand and supply model activity

Handout 1: "The Aggregate Supply and Aggregate Demand Model"; one copy of the handout for each small group of students, cut apart, cards shuffled, and placed in a small bag

Handout 2: "Changes Affecting the Aggregate Supply and Aggregate Demand Model"

Slide 2: "Aggregate Demand and Aggregate Supply Activity"

Slide 3: "Check Your Answers" (for the Aggregate Supply and Aggregate Demand Model)

Money market model activity

Handout 3: "The Money Market Model"; one copy of the handout for each small group of students, cut apart, cards shuffled, and placed in a small bag

Handout 4: "Changes Affecting the Money Market Model"

Slide 4: "Money Market Model Activity"

Slide 5: “Check Your Answers (for the Money Market Model)

Loanable fund market model activity

Handout 5: “The Loanable Funds Market Model”; one copy of the handout for each small group of students, cut apart, cards shuffled, and placed in a small bag

Handout 6: “Changes Affecting the Loanable Funds Market Model”

Slide 6: “Loanable Funds Market Model Activity”

Slide 7: “Check Your Answers” (for the Loanable Funds Market Model)

All model activities

Slide 8: “GoFormative Instructions”

Internet access and projector to display the GoFormative website

Student internet access on touch-screen devices for using GoFormative

Grade level

High school or college

Subject areas

Advanced high school economics or introductory college economics

Preparation

Before class, be sure you have printed and cut apart enough sets of Handout 1, 3, or 5 for each small group you plan to have in class. Only a class set is needed since the students will return each set at the end of class. Be sure to ask the students to shuffle their card matches before returning the pieces to the bag at the end of class.

Next, create or log into your free https://goformative.com/ account. Follow these steps for each graphing exercise you create to run with the students during class:

1. In the upper left of the screen, click “+New Formative.”
2. Name your exercise.
3. Click the “+” in the middle of the screen.
4. Select “Show Your Work” under “Add Question.”
5. Copy the first “Change Affecting the _____ Model” from Handouts 2, 4, or 6 based on which model you are reviewing.
6. Paste the “Change” you copied into the space that says “Type your question here.”

7. Click "Edit Background."
8. Use the drawing tools to create a large version of the model you are teaching. As an alternative, you can upload an image of the graph saved on your computer. The optional presentation provided with this lesson has images of all three graphs that can be saved to your computer for upload.
9. When your graph loads, click "Done" in the upper right corner of the screen.
10. Continue with steps 3 to 9 until you have added all of the questions you want to use with the students.

Procedure

Instructions for using the accompanying presentation are in italics throughout the procedure document.

1. *Display slide 1.* Tell students they will be reviewing their knowledge of the (Insert Aggregate Supply/Aggregate Demand, Money Market, or Loanable Funds Market Model here) in class.

2. Explain to the students you will divide them into small groups and give each group a bag filled with concepts and definitions of all the components of the model as well as the determinants that shift the curves of the model.

3. *Display slide 2, 4, or 6 based on which "macro graph" you are reviewing.* Refer to the slide for the (Insert Aggregate Supply/Aggregate Demand, Money Market, or Loanable Funds Market Model here). Tell students the slide shows the graphic organizer for the activity. Working in groups, they will match the determinants for the demand aspect of the model in the left column, create and label the graph of the model in the center column, and match the determinants for the supply aspect of the model in the right column. Give students approximately 10 minutes to organize their cards and graph the model on a flat surface provided to each group.

4. *Display slide 3, 5, or 7 based on which "macro graph" you are reviewing.* Refer to the "Check Your Answers" slide for the model you are reviewing. Ask students to look at the slide and rearrange their cards and graph to correct any mistakes.

5. *Display slide 8.* Tell students they will now use their devices to shift the curves in the model they created. Refer to the slide and tell them to navigate to https://goformative.com. Instruct them to select "Join Code" at the top of the page. Explain you will launch a browser window and it will have the join code they need. Discuss the drawing tools shown on the slide. These are the items students will use to "show their work" on the graphs you have loaded into the assignment. (For the teacher: display a browser window with GoFormative. Log into your account and select the "formative" you created prior to class. At the top of the screen in the

center, you will see “Assign/Share.” Click this option. Next, click “Guest Students” and “Assign.” The “Join Code” for your assignment will display.)

6. Indicate the “Join Code” on the screen and ask students to enter it on their devices. They will be prompted for their first and last names. Tell students whether you want them to enter their real names or a substitute name. Caution them to keep the names clean or they will have to draw the graphs on paper instead of using their devices. Check to make sure everyone is successfully logged into the assignment. Students will click each “show your work” question and graph the changes required by each question prompt. After they finish each graph, they will click the “Done” button at the top right of the screen to go onto the next question. Students can begin the assessment as soon as they are logged into the system. Walk around the room, assisting students as they work. When it appears most students have finished all of the questions, return to your computer and click “View Responses.”

7. Give each student a copy of Handout 2, 4, or 6 as determined by the model you are reviewing. Tell students they will record the correct answer to each scenario by selecting one of the four graphs illustrated on the handout as A, B, C, or D and place the letter in the box beside the economic change described.

8. Display the student responses on your classroom screen. For each of the graphs drawn in response to each question, ask students if it is correct. Talk them through the parts done correctly and any changes needed. Click on each response as it is reviewed. If the graph is completely correct, move the slider on the right all the way to the right. If it is partially correct, move the slider to indicate what percentage is correct. If the graph is completely incorrect, keep the slider on the left. A color will show in the corner indicating the graph has been checked. Red means incorrect, yellow means partially correct, and green means completely correct. Ask students to choose the correct graph from the options on their handout and record the letter in the box beside the scenario. Continue this process for each response and for each question.

Handout 1: The Aggregate Supply and Aggregate Demand Model

Component of the graph of the AD–AS model
Shifts the aggregate demand curve
Shifts the aggregate supply curve

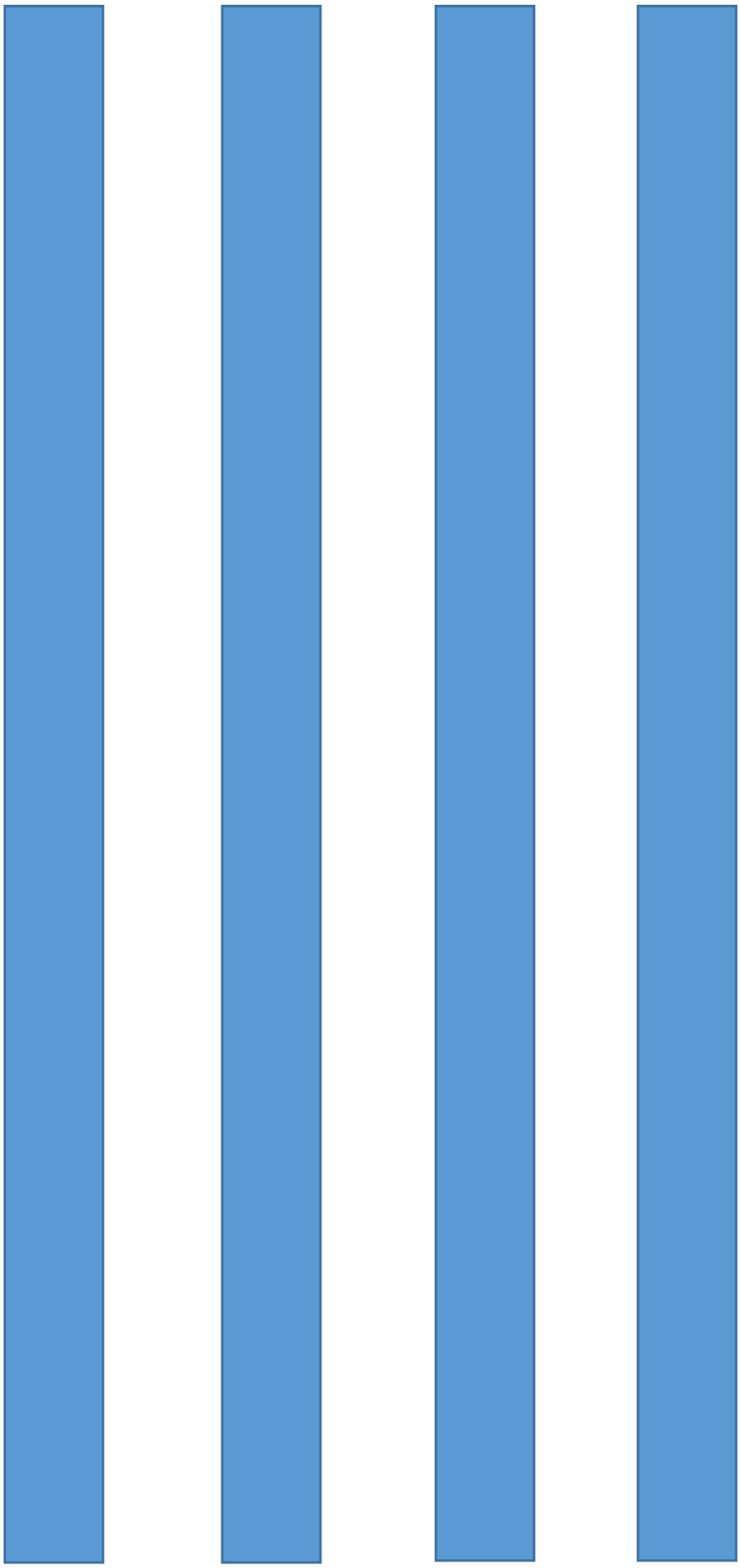
Handout 1: The Aggregate Supply and Aggregate Demand Model (Continued)

Aggregate demand and supply model (AD-AS)	A macroeconomic model illustrating the condition of price level and real gross domestic product in an economy through the relationship of aggregate demand and aggregate supply
Aggregate demand (AD)	The name of the downward-sloping curve illustrating the inverse relationship between price level and real GDP
Aggregate supply (AS)	The name of the upward-sloping curve illustrating the direct relationship between price level and real GDP
Price level (Pl_e)	The name of the y-axis label on a graph of the AD-AS model
Real gross domestic product or real output (RGDP)	The name of the x-axis label on a graph of the AD-AS model
Y	A symbol often used to identify the short-run level of equilibrium output in the AD-AS model
Δ Consumption	The component of aggregate demand affected by household purchases of new vehicles
Δ Investment	The component of aggregate demand that can be affected if businesses believe the economy will significantly expand or contract in the future
Δ Government spending	The component of aggregate demand most affected when a country undertakes the repair of vital infrastructure such as roads and bridges

Handout 1: The Aggregate Supply and Aggregate Demand Model (Continued)

Δ Net exports	The component of aggregate demand affected by a change in the number of cell phones, for example, that U.S. residents purchase from Asian countries
Δ Price of inputs	A change in the wages paid to workers in the economy is an example of this determinant of short-run aggregate supply
Δ Productivity or resource quality	Improvements in human capital and new technology is an example of this determinant of short-run aggregate supply
Δ Legal-institutional environment	Changes in subsidies, corporate tax rate, or business regulations are examples of this determinant of short-run aggregate supply

Handout 1: The Aggregate Supply and Aggregate Demand Model (Continued)

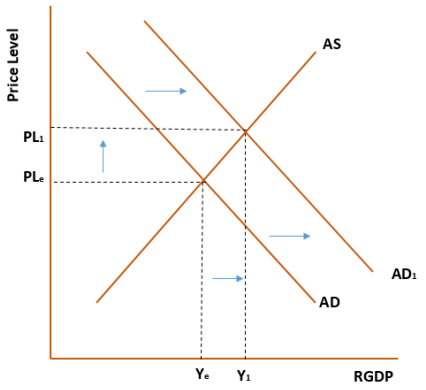


Handout 2: Changes Affecting the Aggregate Supply and Aggregate Demand Model

The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. The price of crude oil, an important natural resource, decreases.	
2. New income tax cuts passed by Congress take effect.	
3. Companies throughout the economy implement technology, increasing automation and productivity.	
4. The U.S. dollar depreciates against the currencies of several key international trading partners.	
5. Firms in the economy are pessimistic about future returns on capital investment.	
6. The government eliminates subsidies to producers of corn, an important input for food and energy production.	

A



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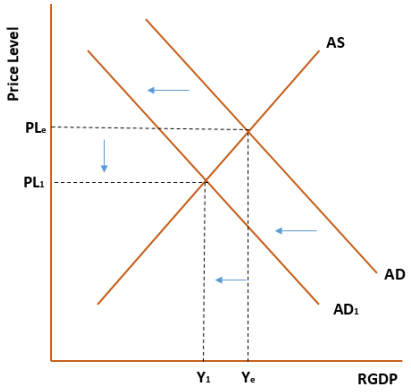

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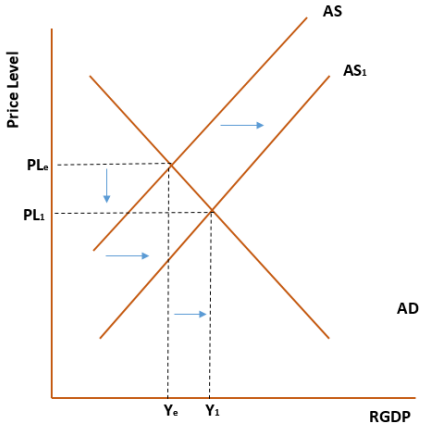

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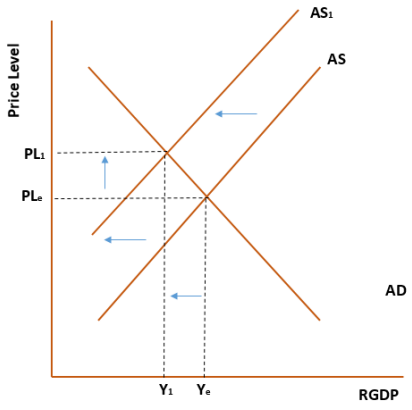
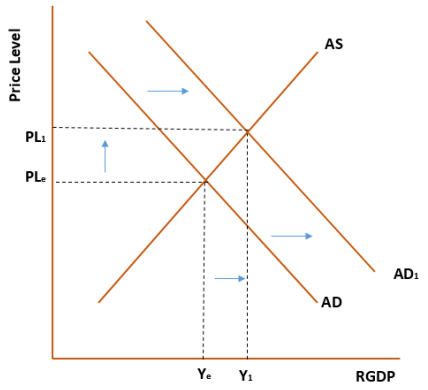


Handout 2: Changes Affecting the Aggregate Supply and Aggregate Demand Model (Answer Key)

The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. The price of crude oil, an important natural resource, decreases.	C
2. New income tax cuts passed by Congress take effect.	A
3. Companies throughout the economy implement technology, increasing automation and productivity.	C
4. The U.S. dollar depreciates against the currencies of several key international trading partners.	A
5. Firms in the economy are pessimistic about future returns on capital investment.	B
6. The government eliminates subsidies to producers of corn, an important input for food and energy production.	D

A



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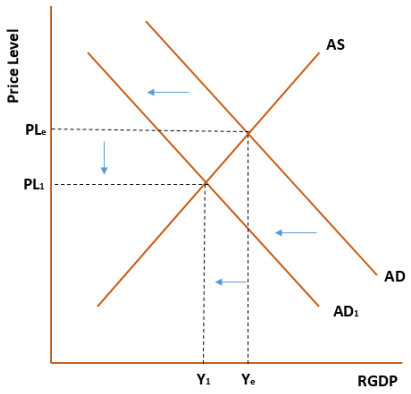

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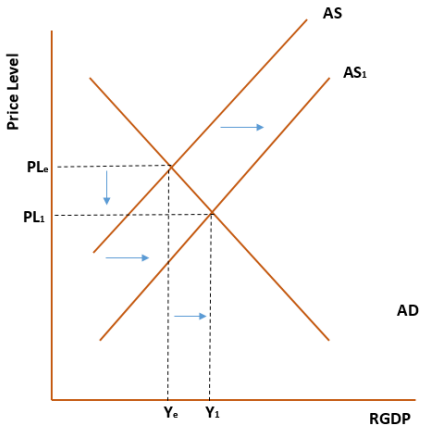

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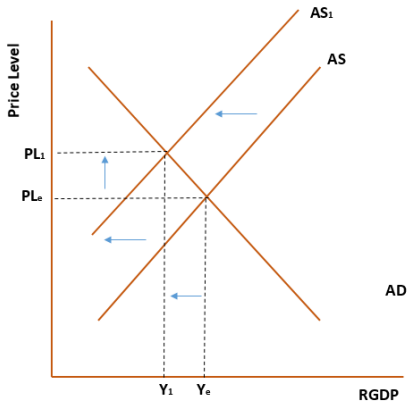


Handout 3: The Money Market Model

Component of the graph of the money market
Shifts demand for money curve
Shifts the supply of money curve

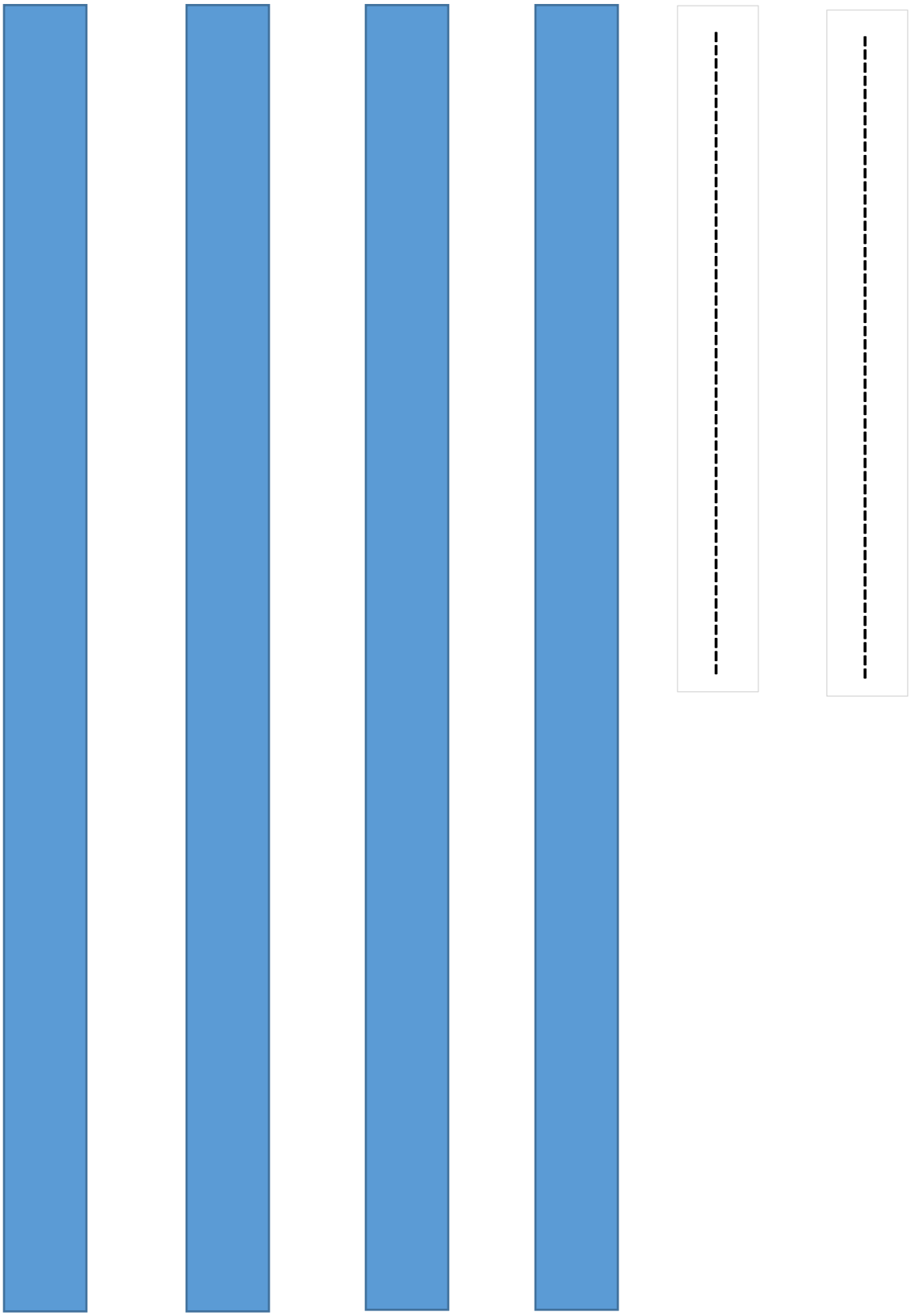
Handout 3: The Money Market Model (Continued)

Money market	A macroeconomic model illustrating the relationship between the nominal interest rates and the demand for and supply of money
Demand for money	This curve illustrates the inverse relationship between the nominal interest rate and the quantity of money the public chooses to hold for day-to-day transactions, as an asset, and as a precaution for unexpected expenses
Supply of money	This curve illustrates how the quantity of money (M1 or M2) in an economy is fixed at a particular moment in time regardless of the nominal interest rate
Nominal interest rate	The price of borrowing money unadjusted for inflation and the name of the vertical axis label on a graph of the money market
Quantity of money	The horizontal axis label in the money market
I	Notation often used to identify the equilibrium nominal interest rate along the vertical axis
Q or Qm	Notation often used to identify the equilibrium quantity of money on the horizontal axis
Δ in open market operations	A determinant of money supply involving a change in the volume of purchases or sales of government securities specified by the Federal Open Market Committee for the purpose of targeting a lower or higher federal funds rate
Δ Reserve ratio	A determinant of money supply involving a change in the percentage of demand deposits financial institutions must hold (not lend) as specified by the Federal Open Market Committee for the purpose of targeting a lower or higher federal funds rate

Handout 3: The Money Market Model (Continued)

Δ Discount rate	A determinant of money supply involving a change in the interest rate charged by the Federal Reserve when making loans to financial institutions for the purpose of targeting a lower or higher federal funds rate
Δ Interest on excess reserves	A determinant of money supply involving a change in the interest rate paid on the excess reserves of financial institutions held with the Federal Reserve for the purpose of targeting a lower or higher federal funds rate
Δ in price level	A determinant of money demand involving how changes in the average level of prices of all goods and services in the economy affect the amount of money people hold at each nominal interest rate
Δ Real income	A determinant of money demand involving how changes in the inflation adjusted income of consumers in the economy affect the amount of money people hold at each nominal interest rate
Δ Real interest rates	A determinant of money demand involving how changes in the inflation adjusted interest rates available to consumers in the economy affect the amount of money people hold at each nominal interest rate
Δ Payment-related technology	A determinant of money demand involving how changes in the methods consumers in the economy use to pay for goods and services affect the amount of money people hold at each nominal interest rate.

Handout 3: The Money Market Model (Continued)



Handout 4: Changes Affecting the Money Market Model

The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. During a time of economic recession, the Federal Open Market Committee targets a lower federal funds rate by buying bonds on the open market.	
2. An increased use of credit cards causes consumers to hold less money.	
3. An increase in the price level means it take more money to purchase the same basket of consumer goods.	
4. The Fed raises the interest rate paid on excess reserves to fend off inflation.	
5. The real incomes of consumers in the economy falls.	
6. A decrease in the discount rate signals that the Fed would like to see an increase in lending by banks.	

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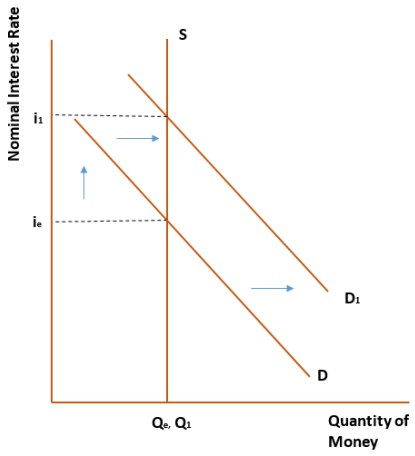

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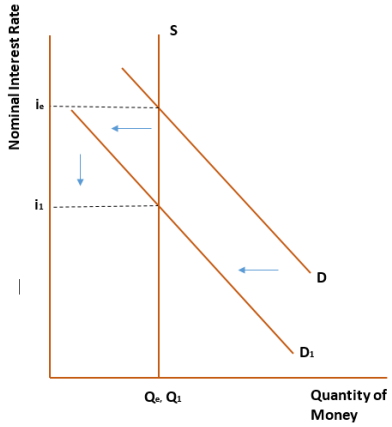

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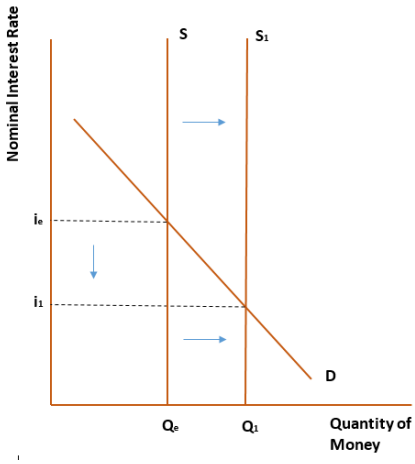

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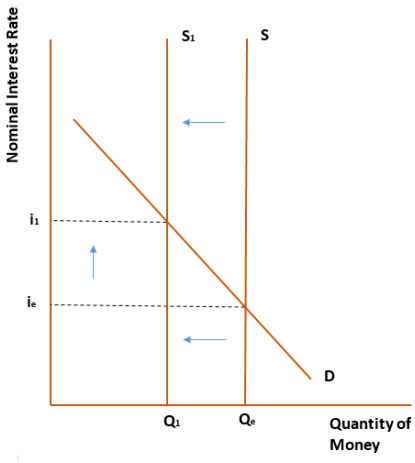
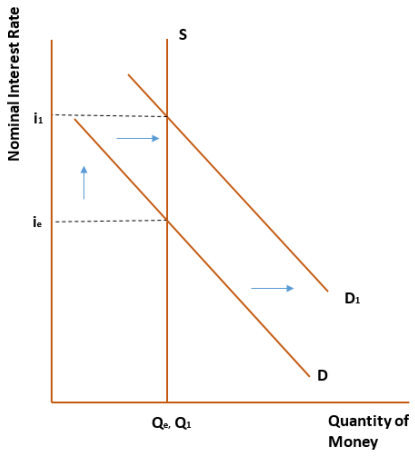


Handout 4: Changes Affecting the Money Market Model (Answer Key)

The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. During a time of economic recession, the Federal Open Market Committee targets a lower federal funds rate by buying bonds on the open market.	**C**
2. An increased use of credit cards causes consumers to hold less money.	**B**
3. An increase in the price level means it take more money to purchase the same basket of consumer goods.	**A**
4. The Fed raises the interest rate paid on the excess reserves of banks to fend off inflation.	**D**
5. The real incomes of consumers in the economy falls.	**B**
6. A decrease in the discount rate signals that the Fed would like to see an increase in lending by banks.	**C**

A



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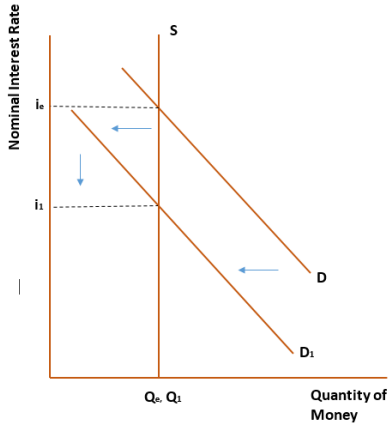

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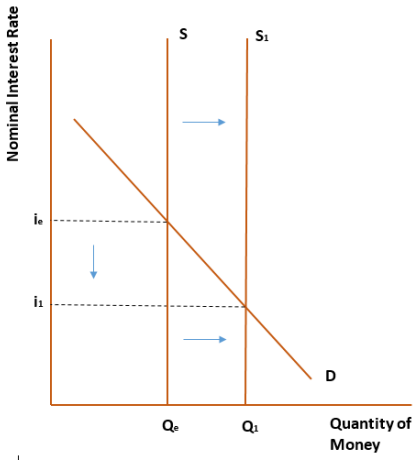

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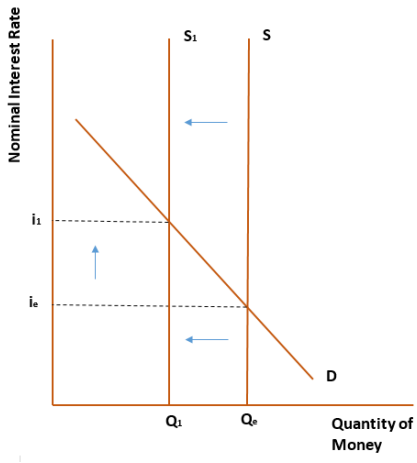


Handout 5: The Loanable Funds Market Model

Components of the graph of the loanable funds market

Shifts demand for loanable funds curve

Shifts the supply of loanable funds curve

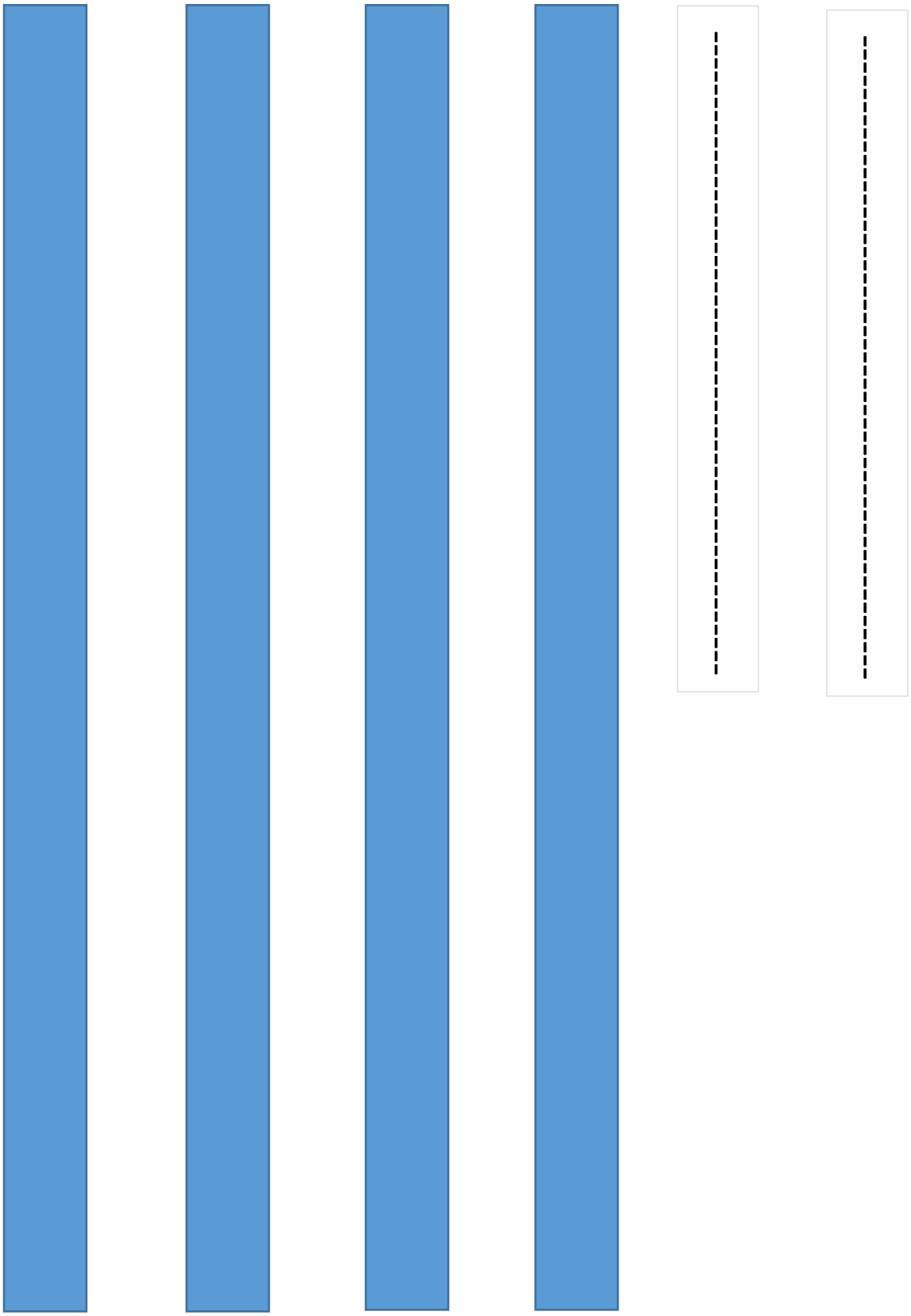
Handout 5: The Loanable Funds Market Model (Continued)

Loanable funds market	A model illustrating the relationship between the real interest rates and the demand for and supply of loanable funds
Demand for loanable funds	This curve illustrates the inverse relationship between the real interest rate and the quantity of loanable funds individuals, firms, and government are willing and able to borrow in the economy
Supply of loanable funds	This curve illustrates the direct relationship between the real interest rate and the quantity of loanable funds savers are willing and able to lend in the economy
Real interest rate	The price of borrowing money adjusted for inflation and the name of the vertical axis label on a graph of the loanable funds market
Quantity of loanable funds	The horizontal axis label in the loanable funds market
R_e	Notation often used to identify the equilibrium real interest rate along the vertical axis
Qlf_e or Q_e	Notation often used to identify the equilibrium quantity of loanable funds on the horizontal axis

Handout 5: The Loanable Funds Market Model (Continued)

Δ in disposable income of consumers	A determinant of the supply of loanable funds. When consumers have a change in disposable income, they will also have a change in the amount of income they save
Δ in foreign investment	A determinant of the supply of loanable funds involving a change in the amount of financial capital foreigners invest in the economy
Δ in expected return on investment	A determinant of loanable funds demand based on whether firms in the economy expect the rate of return on investments in capital to be higher or lower in the future
Δ in government deficit spending	A determinant of loanable funds demand involving changes in the amount the government needs to borrow in order to pay for public goods and services

Handout 5: The Loanable Funds Market Model (Continued)



Handout 6: Changes Affecting the Loanable Funds Market Model

The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. Personal savings of individuals in the U.S. economy decrease.	
2. Japanese foreign investment in the United States declines.	
3. The U.S. federal government increases deficit spending to fund new infrastructure projects.	
4. The U.S. Congress passes legislation offering large tax credits to firms making investments in new capital.	
5. Congress eliminates taxes on the first $100,000 in interest income earned from savings.	

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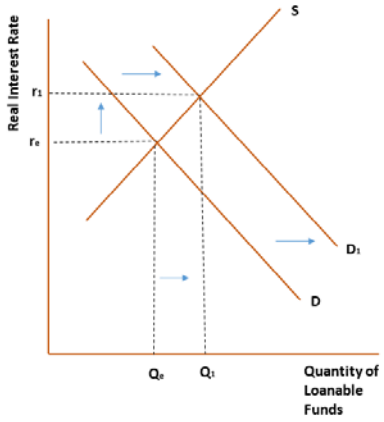

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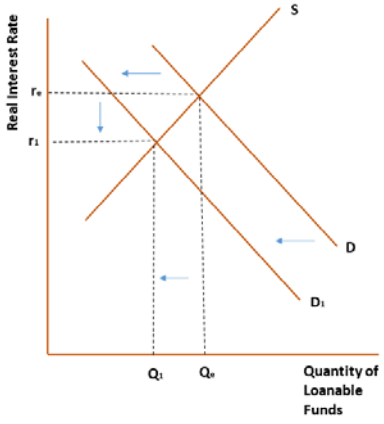

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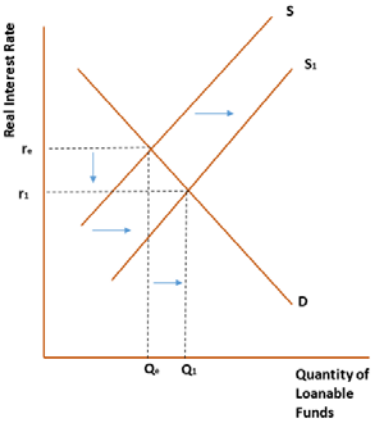

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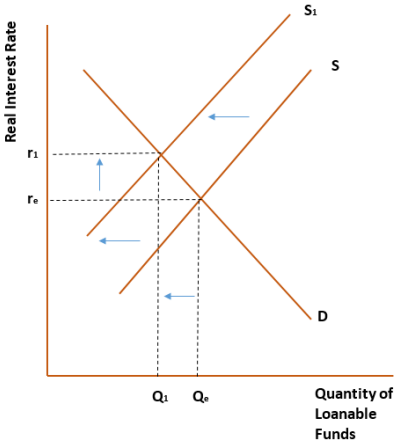
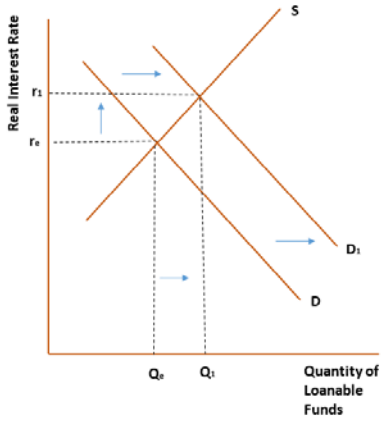


Handout 6: Changes Affecting the Loanable Funds Market Model (Answer Key)

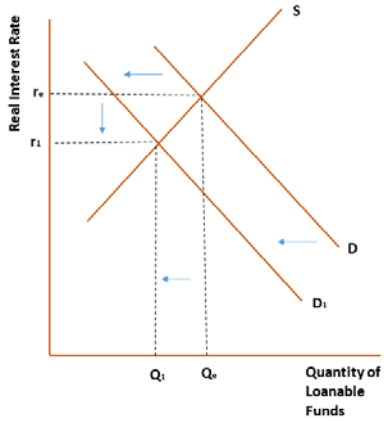
The following changes in economic conditions will affect either the aggregate demand curve or the aggregate supply curve. Match each scenario to the graph below that correctly illustrates the change.

Economic Change	Graph
1. Personal savings of individuals in the U.S. economy decrease.	**D**
2. Japanese foreign investment in the United States declines.	**B**
3. The U.S. federal government increases deficit spending to fund new infrastructure projects.	**A**
4. The U.S. Congress passes legislation offering large tax credits to firms making investments in new capital.	**A**
5. Congress eliminates taxes on the first $100,000 in interest income earned from savings.	**C**

A



B



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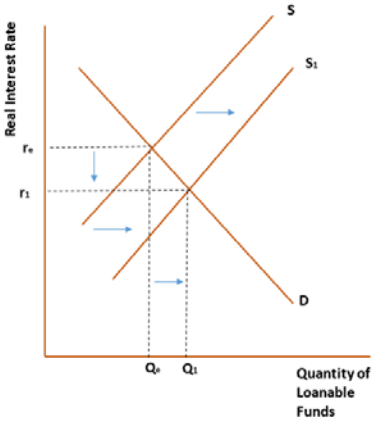

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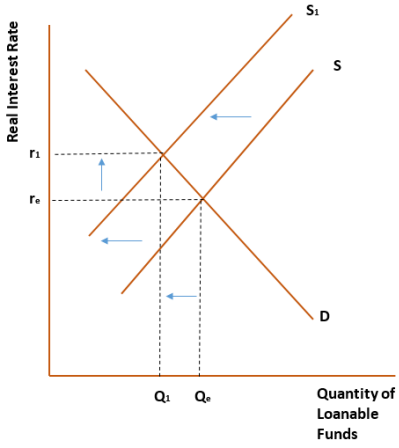

National Voluntary Standards in Economics

Content Standard 18: Economic Fluctuations

Students will understand that:

Fluctuations in a nation's overall levels of income, employment, and prices are determined by the interaction of spending and production decisions made by all households, firms, government agencies, and others in the economy. Recessions occur when overall levels of income and employment decline.

Students will be able to use this knowledge to:

Interpret media reports about current economic conditions and explain how these conditions can influence decisions made by consumers, producers, and government policymakers.

Content Standard 20: Fiscal and Monetary Policy

Students will understand that:

Federal government budgetary policy and the Federal Reserve System's monetary policy influence the overall levels of employment, output, and prices.

Students will be able to use this knowledge to:

Anticipate the impact of federal government and Federal Reserve System macroeconomic policy decisions on themselves and others.