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Principles of Economics

Model #4: The Short Run AD-AS Model

Introduction:

This model improves upon model #3 because

- 1) This model allows prices to rise and fall. Thus we can forecast how events affect inflation.
- 2) This model has a better characterization of producers, allowing them to respond to changing conditions not only by changing production but also by changing prices.

Don't forget: this model can only do short run forecasts; it can only predict how events affect the economy over 6-12 months.

Preview:

Once again, as with our other models, we model the economy as one giant market. We aggregate buyers together, and depict how events change their buying behavior. And we aggregate sellers together, and see how events change the amount of output that they supply and the prices that they charge for their products.

Name change: Aggregate Expenditures is now known as **aggregate demand**

In models 1, 2, and 3, our name for buyers' total spending was "aggregate expenditures." We now change the name of total spending to "aggregate demand." Why the name change? Who knows? It's really the same thing that we have known already:

$$\text{Aggregate demand} = C + I + G + (EX - IM)$$

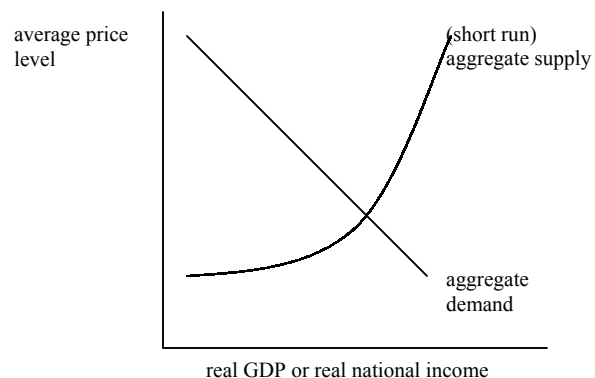
Aggregate supply and the end of the passive producers:

In models 1, 2, and 3, our assumptions about producers were quite simple. We assumed that producers respond to changes in spending by changing their level of production without changing prices. Well, now we get rid of the fixed prices assumption.

(Short run) Aggregate Supply depicts how producers respond to changing conditions by changing production *and* prices.

The Model Graphed:

Model #4 looks like this graphed:



A Closer Look at Aggregate Demand

Aggregate demand (AD) measures the total amount of spending in the economy.

$$AD = C + I + G + (EX - IM)$$

Aggregate demand and prices

A lower average price level causes aggregate demand to be larger. (On the graph, lower average prices cause a *movement down along* the Aggregate demand curve from left to right.)

Why do lower prices cause higher aggregate demand along the AD curve?

Lower prices reduce the demand for money. A lower money demand causes lower interest rates. Lower interest rates cause:

- higher investment (I)
- a depreciated dollar, which causes higher net exports (EX-IM)

Thus: as we move down along the AD curve from left to right, investment and net exports are rising.

Other things that affect Aggregate demand

Events such as those listed below shift the aggregate demand (AD) curve by changing spending by households, firms, the government, or foreigners:

- i) Events which change C and shift AD:
 - a change in consumer confidence
 - a change in household wealth
 - a change in transfer payments
 - a change in household tax rates
- ii) Events which change I and shift AD:
 - a change in the money supply (usually by the Central Bank, affecting r)
 - a change in profit expectations
- iii) Events which change G and shift AD:
 - lawmakers change the law to change in G
- iv) Events which change (EX – IM) and shift AD:
 - a change in spending on exports by foreigners, due to their changing incomes
 - a change in the nominal money supply (which affects r and exchange rates)

If any of the above events cause *higher* aggregate demand then the AD curve shifts to the *right*.

If any of the above events cause *lower* aggregate demand then the AD curve shifts to the *left*.

A Closer Look at short run Aggregate Supply

Short run Aggregate Supply (AS) measures the total amount of production in the economy in the short run.

AS = total amount of production in the economy

Aggregate supply and prices

Higher production levels are accompanied by higher average prices along the AS curve. (On the graph, higher production levels cause a *movement up along* the short run Aggregate Supply curve from left to right.)

Why do higher levels of production cause higher prices along the AS curve?

When firms respond to higher demand for their products by increasing production, they must also raise the prices for their products. This is because higher production levels raise the **average cost of production**—the cost, on average, of hiring labor, employing capital and land, and buying raw materials in order to produce a unit of output. And when average production costs rise, firms are forced to raise the prices that they charge for their products, in order to avoid losing money.

Other things that affect short run Aggregate supply

Events such as those listed below shift the short run aggregate supply (AS) curve by changing average costs of production:

- a change in technology allowing firms to produce more output with the same amount of inputs
- a change in the wages at which people are willing to work
- supply shocks, such as a sudden increase in the cost of crude oil
- a change in business taxes, subsidies, or regulations

If any of the above events cause *higher* average costs then the short run AS curve shifts upward.

If any of the above events cause *lower* average costs then the short run AS curve shifts downward.

Short run forecasting: how events change Y, P, and unemployment

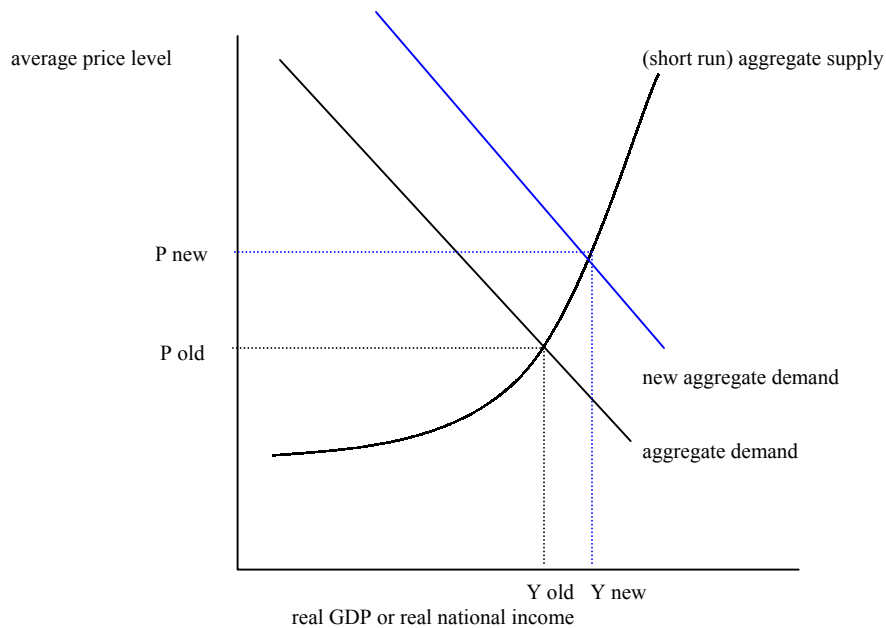
Let's do a few forecasts below using model #4 to forecast how events will affect real GDP and real national income (Y), the average price level (P), and unemployment.

Example 1: Government raises G:

Short run forecast:

- This increases AD, since G is a part of AD.
- The AD curve shifts right, resulting in higher equilibrium Y and P
- Cyclical unemployment falls due to higher production.

Graphed, the effects of the hike in G look like this:



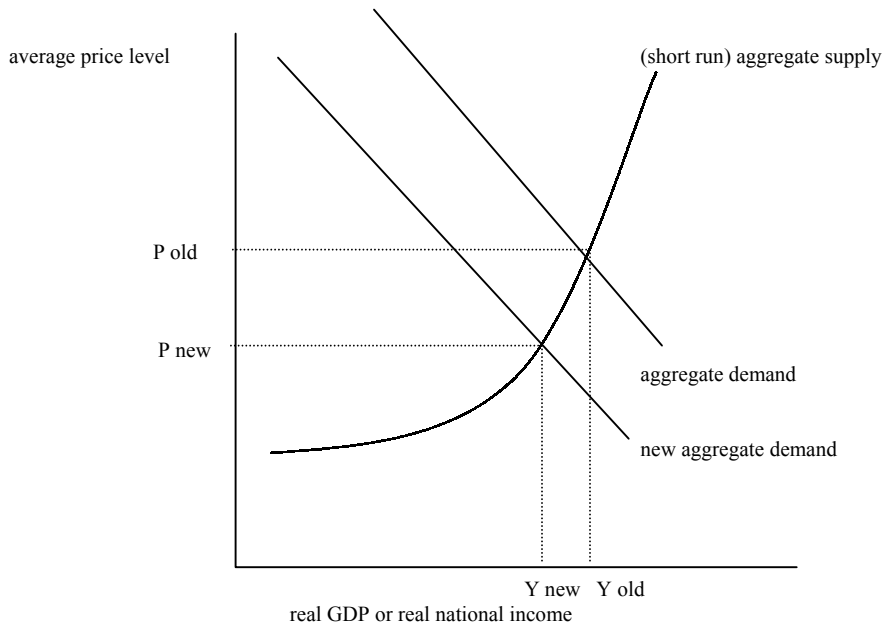
Note that unemployment and inflation move in opposite directions; unemployment falls and inflation rises.

Example 2: Central bank raises the discount rate:

Short run forecast:

- This reduces the money supply, causing higher short run interest rates.
- Higher interest rates reduce investment
- Higher interest rates also cause an appreciated dollar, reducing net exports
- Since I and (EX-IM) have both fallen, AD falls; the AD curve shifts left.
- Y and P fall.
- Unemployment rises due to the lower level of production

Graphed, the effects of the Fed policy look like this:

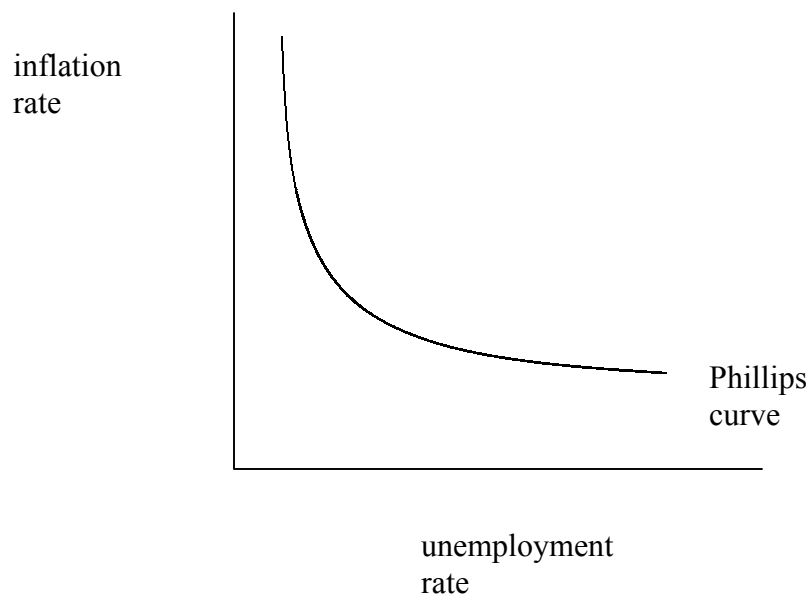


Note that unemployment and inflation move in opposite directions; unemployment rises and inflation falls.

A Slight Digression: Inflation, unemployment, and the Phillips curve

In the previous two examples, inflation and unemployment moved in opposite directions. Indeed, perhaps the reader can see that *any event that shifts the AD curve causes a short run tradeoff between inflation and unemployment*—one will rise while the other will fall.

An economist named Phillips drew a curve to represent this short run tradeoff that often exists between inflation and unemployment. The curve is known as the **Phillips Curve**. It looks like this:



End of slight digression.

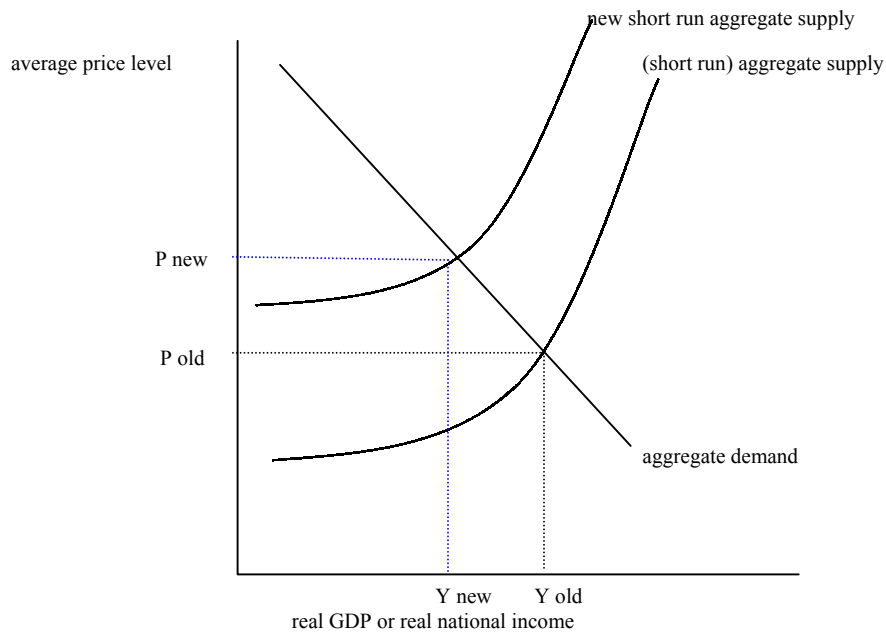
In the early 1960s economists believed that there was ALWAYS a short run tradeoff between inflation and unemployment. But sometimes inflation and unemployment move in the same direction. Let's do two examples on the next two pages of notes.

Example 3: Crude oil costs skyrocket:
(This happened twice in the 1970s)

Short run forecast:

- This increases average production costs, since crude oil is an important determinant of production costs.
- The AS curve shifts up, resulting in higher equilibrium P and lower Y
- Cyclical unemployment rises due to lower production.

Graphed, the effects of the hike in crude oil costs look like this:



Note that unemployment and inflation move in the same directions; unemployment rises and inflation rises.

Stagflation means a simultaneous increase in inflation and unemployment.

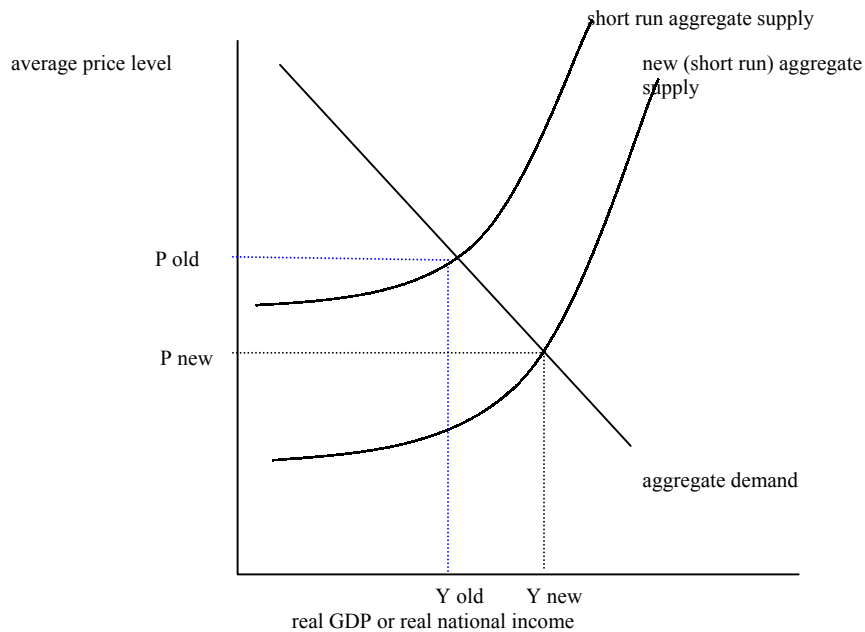
Example 4: Production technology advances:

(This happened throughout the late 1990s with advances in networking and software.)

Short run forecast:

- This reduces average production costs, since more output can be produced with the same amount of inputs.
- The AS curve shifts down, resulting in lower equilibrium P and higher Y
- Cyclical unemployment falls due to higher production.

Graphed, the effects of the improvement in technology look like this:



Note that unemployment and inflation move in the same directions; unemployment falls and inflation falls.

Now let's do more in depth forecasting of the short run effects of events, using model #4.

Things that influence economic variables in the short run

Below, let's list some important economic variable and the things that influence them in the short run. (This is mostly a review.)

i) Events which change Consumption and personal savings:

Very powerful

- a change in consumer confidence
- a change in household wealth
- a change in transfer payments
- a change in household tax rates

Powerful

- a change in national income (Y)

ii) Events which change Investment:

Very Powerful

- a change in the money supply (usually by the Central Bank, affecting r)
- a change in profit expectations

Powerful

- a change in the average price level (P) (Affects money demand and r)

Less Powerful

- a change in national income (Y) (Affects money demand and r)

iii) Events which change the budget surplus (or budget deficit)

Very powerful

- lawmakers change the law to change in G, tax rates, or transfer payment

Powerful

- a change in national income (the tax base)

iv) Events which change the trade deficit (or trade surplus) and external debt:

Very powerful

- a change in spending on exports by foreigners, due to their changing incomes
- a change in the money supply (which affects r and exchange rates)

Powerful

- a change in the average price level (Affects money demand, r and exchange rates)

Less Powerful

- a change in national income (Y) (Affects money demand, r and exchange rates)

v) Events which change interest rates

Very powerful

- a change in the money supply by the Central Bank (Fed)

Powerful

- a change in the price level (Affects money demand)

Less powerful

- a change in Y (Affects money demand)

vi) Events which change unemployment

Very powerful

- a change in Y

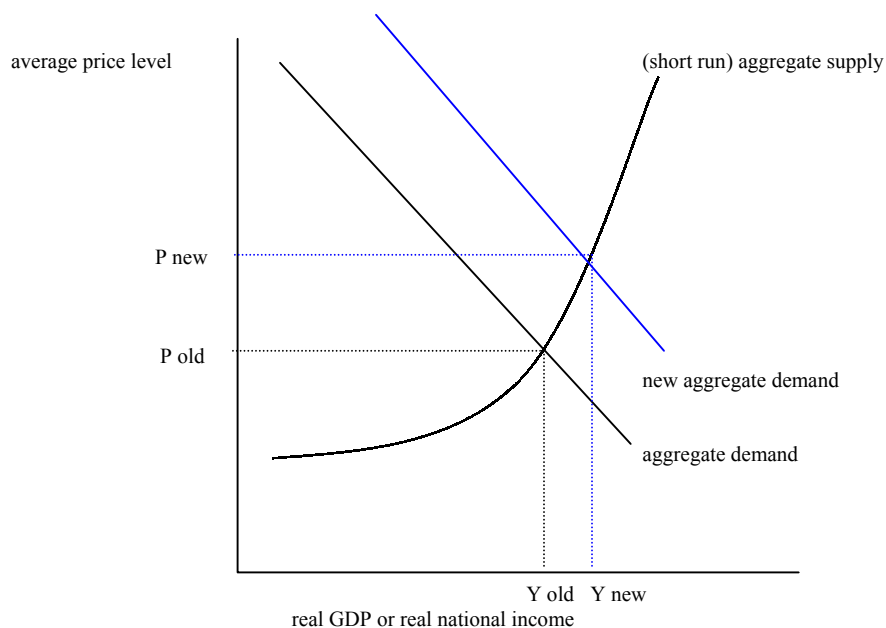
Armed with this list, let's do some in depth forecasting

Example 5: Government raises transfer payments:

Short run forecast:

- This increases disposable income, causing C (and savings) to rise.
- Higher C means higher AD, since C is a component of AD
- The AD curve shifts right, resulting in higher equilibrium Y and P
- Cyclical unemployment falls due to higher production.

Graphed, the effects of the hike in transfer payments look like this:



More forecasts:

- Higher P causes higher money demand and higher interest rates
- Higher interest rates cause lower investment
- Higher interest rates cause an appreciated dollar and a higher trade deficit (or a lower trade surplus)

--If the government originally had a budget surplus: Higher government spending causes the surplus of tax revenue above government spending to shrink, so the budget surplus shrinks.

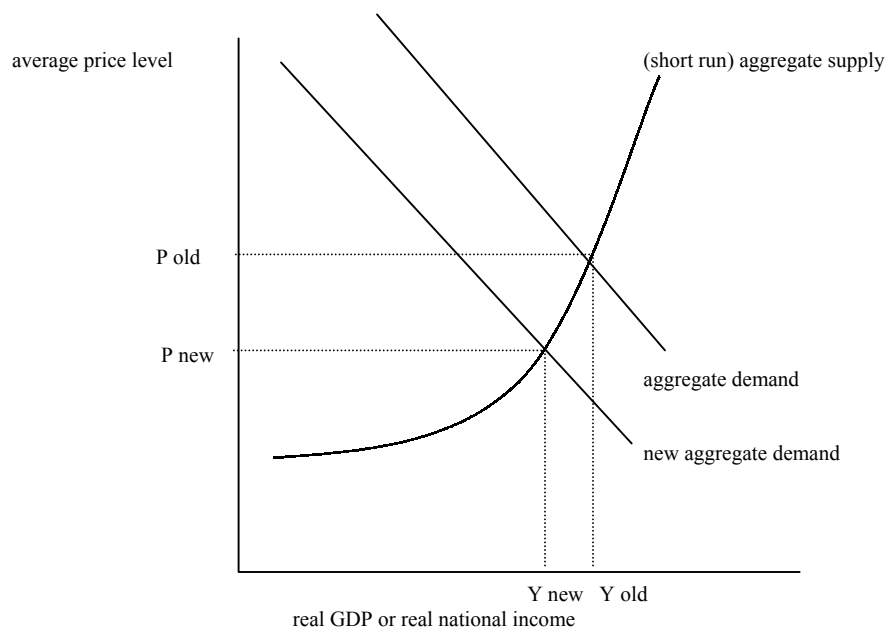
--If the government originally had a budget deficit: Higher government spending causes the excess of government spending above tax revenue to widen, so the budget deficit grows.

Example 6: Central bank sells government securities:

Short run forecast:

- This reduces the money supply, causing higher short run interest rates.
- Higher interest rates reduce investment
- Higher interest rates also cause an appreciated dollar, reducing net exports
- Since I and (EX-IM) have both fallen, AD falls; the AD curve shifts left.
- Y and P fall.
- Unemployment rises due to the lower level of production

Graphed, the effects of the Fed policy look like this:



Other forecasts:

- Consumption and savings both fall, since national income is lower
- Tax revenue falls, since the tax base (national income) has shrunk. This means that if the government originally had a budget surplus then it is smaller. If the government originally had a budget deficit then it is bigger.

Example 7: Production technology advances:

(This happened throughout the late 1990s with advances in networking and database software.)

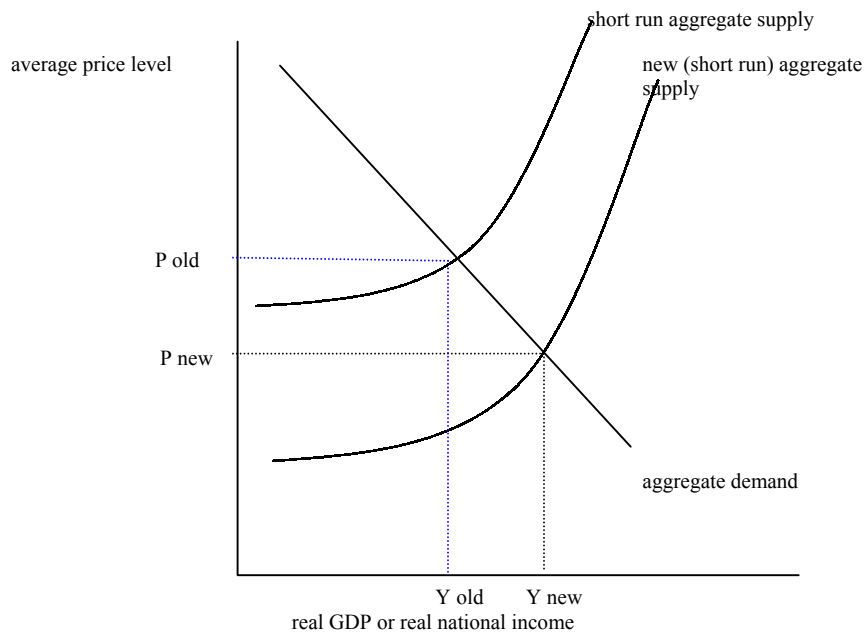
Short run forecast:

--This reduces average production costs, since more output can be produced with the same amount of inputs.

--The AS curve shifts down, resulting in lower equilibrium P and higher Y

--Cyclical unemployment falls due to higher production.

Graphed, the effects of the improvement in technology look like this:



More forecasts:

--Consumption and savings are both higher, since national income is higher

--Interest rates are lower, since lower prices cause lower money demand

--Investment is higher since interest rates are lower

--Lower interest rates cause the dollar to depreciate, causing the trade deficit to shrink (or the trade surplus to grow)

--More national income means a bigger tax base, causing tax revenue to grow. This increases a budget surplus (or reduces a budget deficit).