

3543 Fiscal and Financial System in Japan A
/ KC3002 International Finance

Fall 2013

Lecture 9(Dec 6)

Equilibrium in Goods Market(cont.)/

DD-AA Model

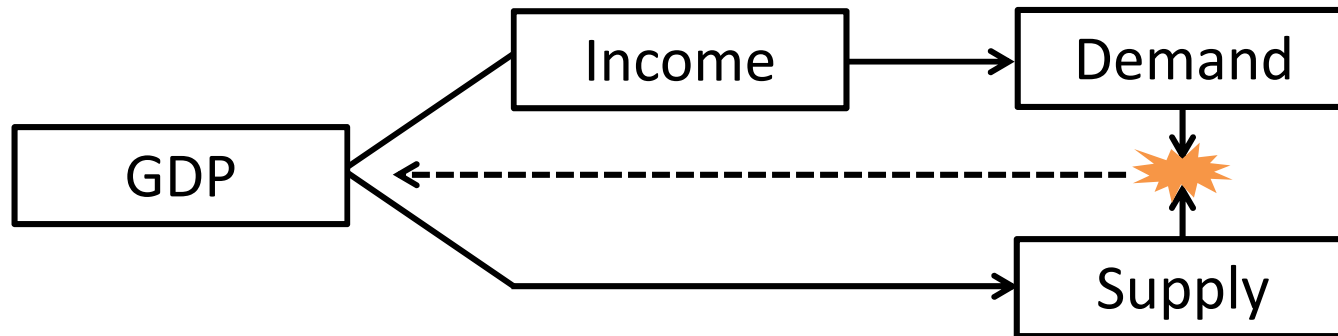
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GDP: EQUILIBRIUM IN GOODS MARKET

Rev 1

Demand-and-Supply Principle: GDP



Once goods are produced and supplied, they generate income and affect demand for goods themselves.

The interaction between demand and supply forces GDP to increase or decrease, until demand matches supply.

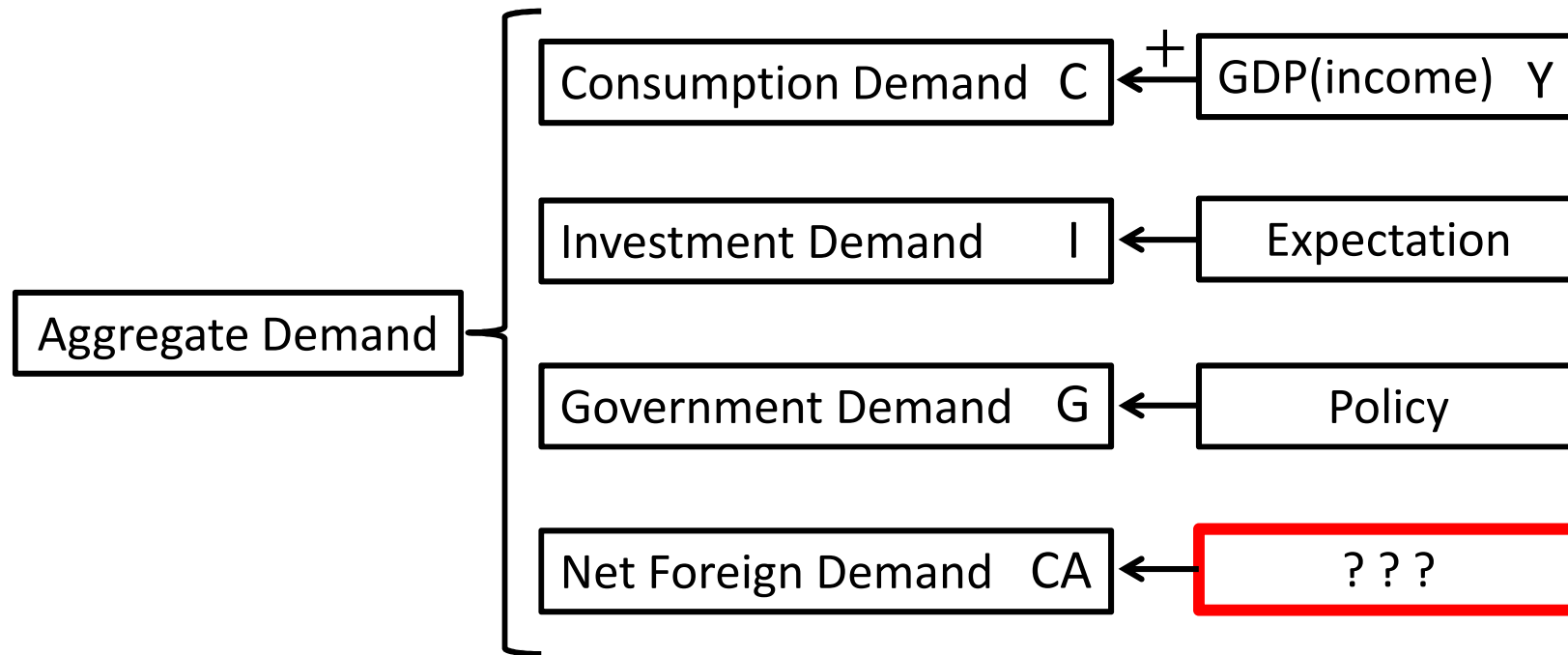
How is aggregate demand for and supply of goods determined?

How is GDP determined?

Rev 2

Aggregate Demand and Its Determinants

Aggregate demand for goods/services consists of the four different types of demands:



Net Foreign Demand for Home Output(1)

Determinants of Net Foreign Demand

- Prices of Japanese Goods
- Prices of US Goods
- Yen/Dollar Exchange Rate
- Japan's Income or GDP
- US Income or GDP

Net Foreign Demand for Home Output(2)

- A rise in the prices of Japanese goods

Even if the US prices are constant, Japanese people *substitute* part of Japanese goods with US goods, which are now *relatively* cheaper.

Japanese people buy more US goods and less Japanese goods, raising Japan's demand for US goods. IM ↑

Similarly, US residents *substitute* part of Japanese goods with US goods, and buy more US goods and less Japanese goods, lowering US demand for Japanese goods. EX ↓

With US prices and exchange rate constant, a rise in Japan's prices lowers net US demand for Japan's output.

Net Foreign Demand for Home Output(3)

- A rise in the prices of US goods

Even if Japan's prices are constant, Japanese people *substitute* part of US goods with Japanese goods, which are now *relatively* cheaper.

Japanese people buy more Japanese goods and less US goods, lowering Japan's demand for US goods. IM ↓

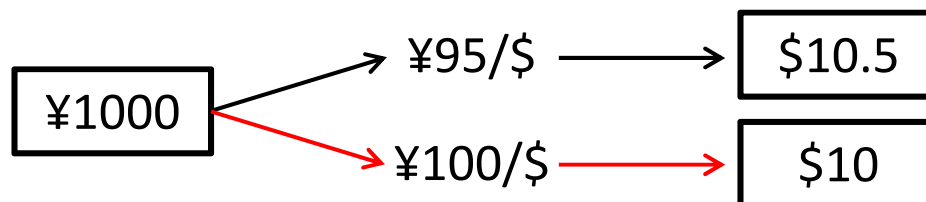
Similarly, US residents *substitute* part of US goods with Japanese goods, and buy more Japanese goods and less US goods, raising US demand for Japanese goods. EX ↑

With Japan's prices and exchange rate constant, a rise in US prices raises net US demand for Japan's output.

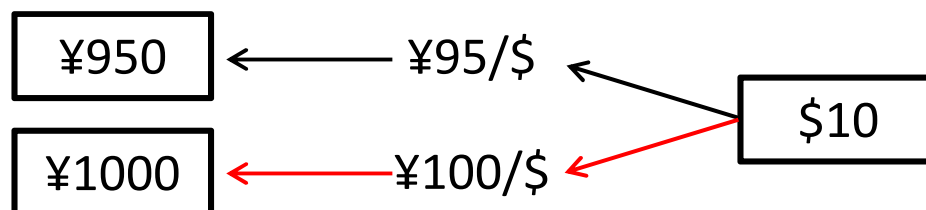
Net Foreign Demand for Home Output(4)

- A rise in the yen/dollar exchange rate (yen's depreciation)

Even if the yen prices of Japanese goods are fixed, a change in exchange rates affects the *dollar prices* of Japanese goods.



Even if the dollar prices of US goods are fixed, a change in exchange rates affects the *yen prices* of US goods.



With the prices constant, a yen's depreciation makes Japanese goods relatively cheaper.

Net Foreign Demand for Home Output(5)

With the prices constant, a yen's depreciation makes Japanese goods relatively cheaper.

Japanese and US residents *substitute* part of US goods with Japanese goods, lowering Japan's demand for US goods and raising US demand for Japanese goods.

A yen's depreciation raises net US demand for Japanese output.

Net Foreign Demand for Home Output(6)

- A rise in Japan's income (GDP)

Japanese people buy more goods from the US. $IM \uparrow$

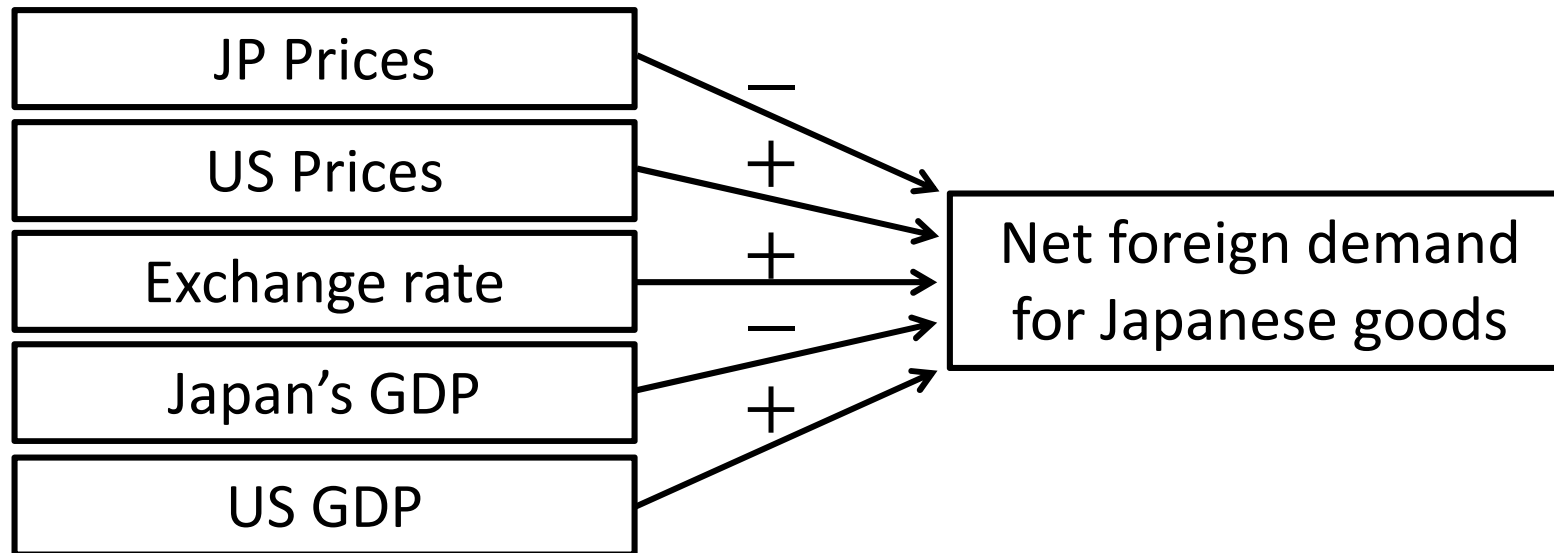
With US income constant, a rise in Japan's income raises Japan's demand for US output, lowering net US demand for Japan's output.

- A rise in US income (GDP)

US people buy more goods from Japan. $EX \uparrow$

With Japan's income constant, a rise in US income raises US demand for Japan's output, raising net US demand for Japan's output.

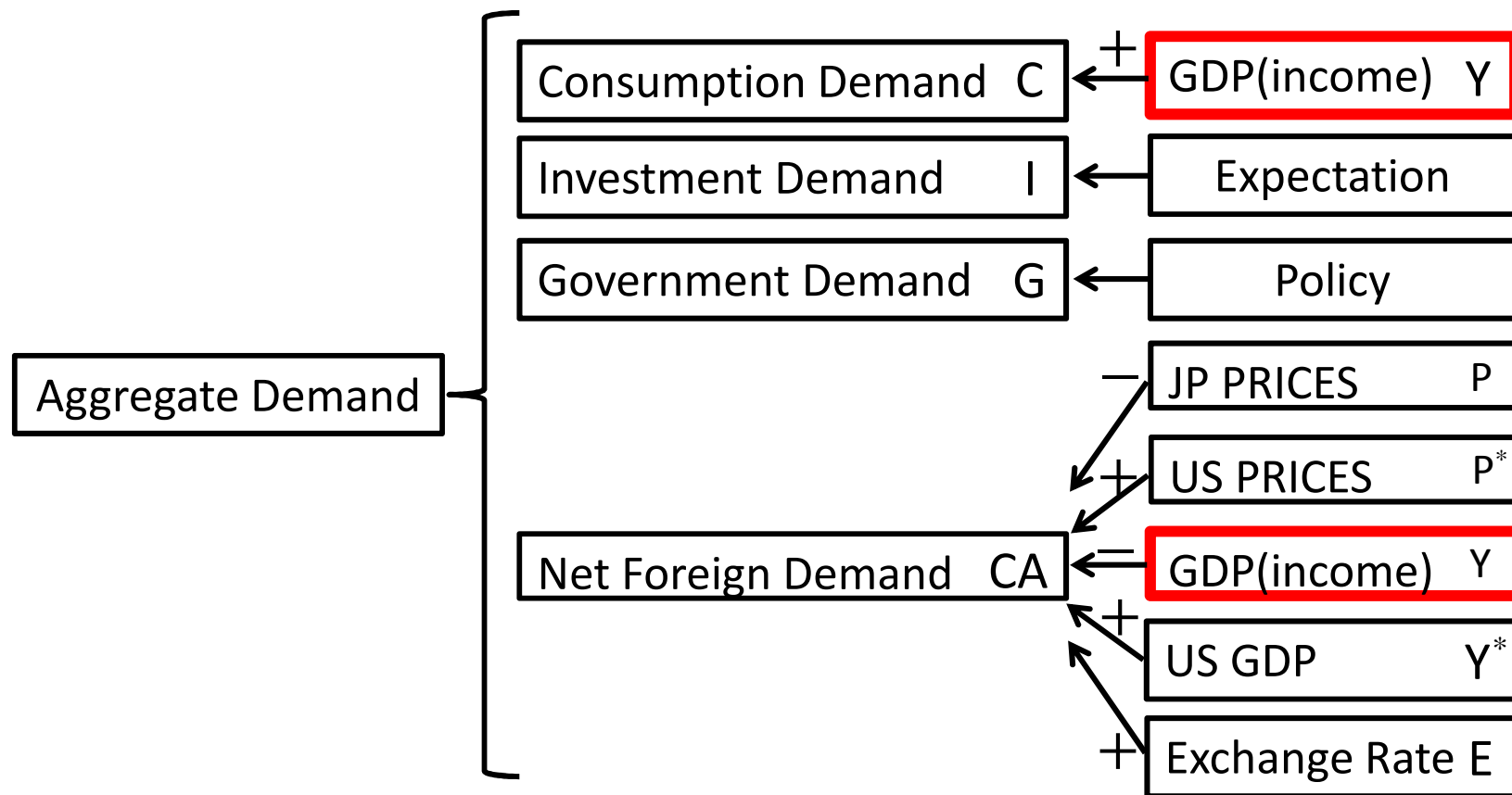
Net Foreign Demand for Domestic Output (Current Account)



The net foreign demand for the Japanese goods depends on:

1. Japan's price level P ,
2. US price level P^* ,
3. the yen/dollar exchange rate E_0 ,
4. Japan's income Y , and
5. US income Y^* .

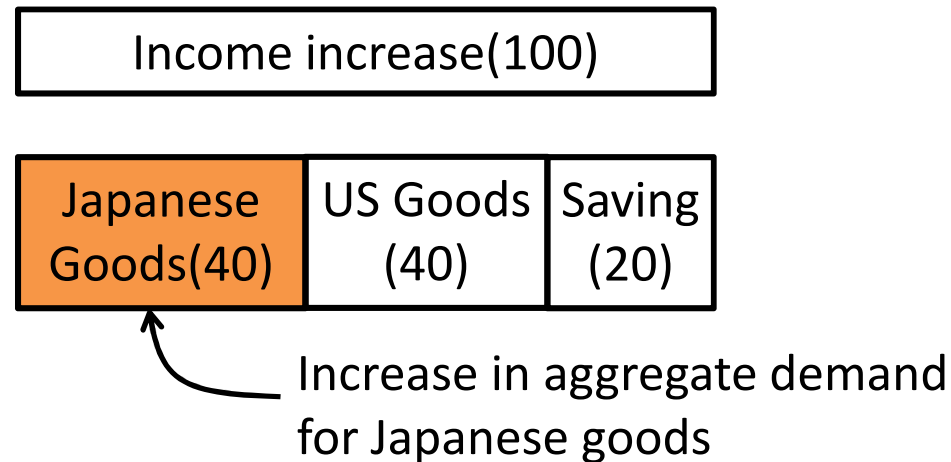
Determinants of Aggregate Demand



What is the net impact of income increase on aggregate demand?
Positive, negative, or ambiguous?

Domestic Income and Aggregate Demand

As Japan's income increases, some part of the income increase is spent on domestic goods, other part is spent on foreign goods, and the rest is *saved*.



The effect on aggregate demand of domestic income is positive but *smaller than the income increase*.

That is, one yen of increase in income raises aggregate demand *by less than one yen*.

Aggregate Demand Schedule

Hold constant the other variables that affect aggregate demand, for example, $E_0 = 100$, $I = 100$, $G = 50$, $Y^* = 1,000$, $P = 200$, $P^* = 20$.

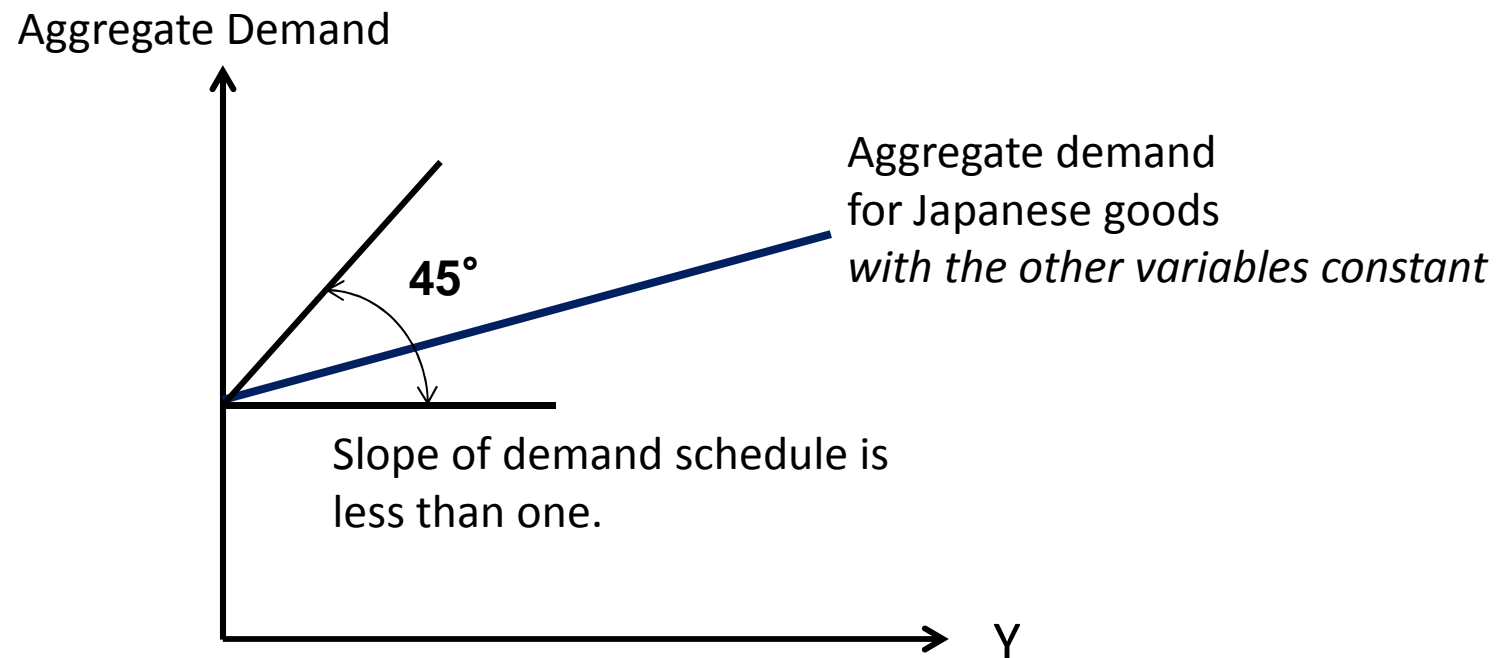
Change Japan's GDP alone, and find how aggregate demand changes. → Aggregate Demand Schedule

GDP	C	I	G	CA	Aggregate Demand
300	180	100	50	30	360
400	240	100	50	10	400
500	300	100	50	-10	440
600	360	100	50	-30	480

I and G are constant because neither is affected by current income.

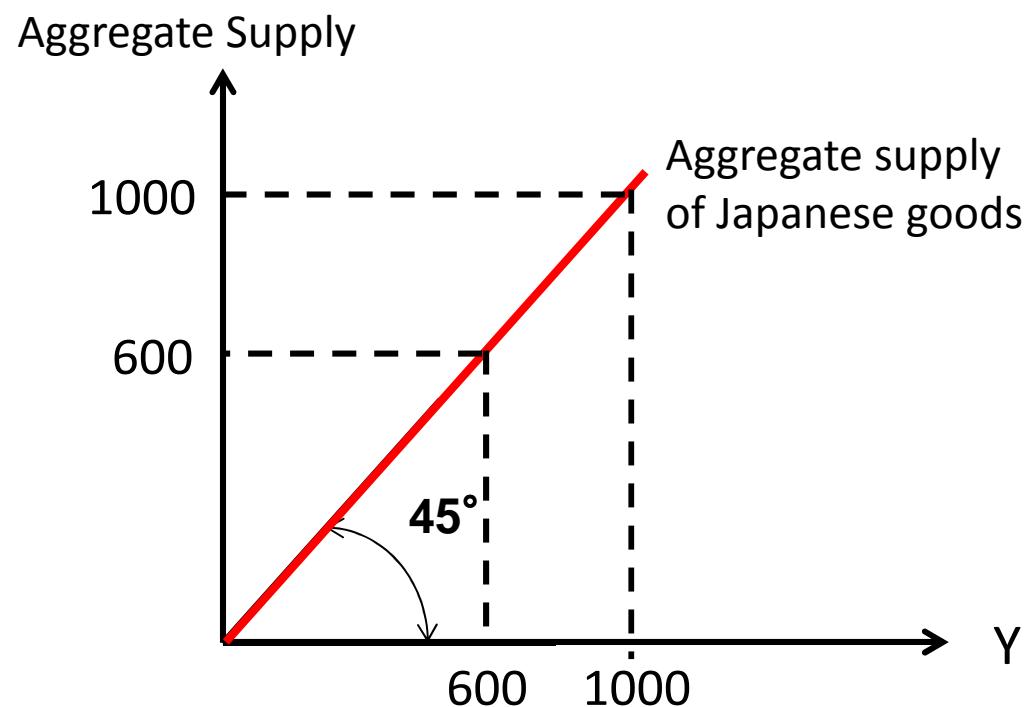
Aggregate Demand Schedule

If we hold the other variables constant, the relationship between Japan's GDP and aggregate demand for its goods is represented by an upward sloping curve with a slope of less than one.

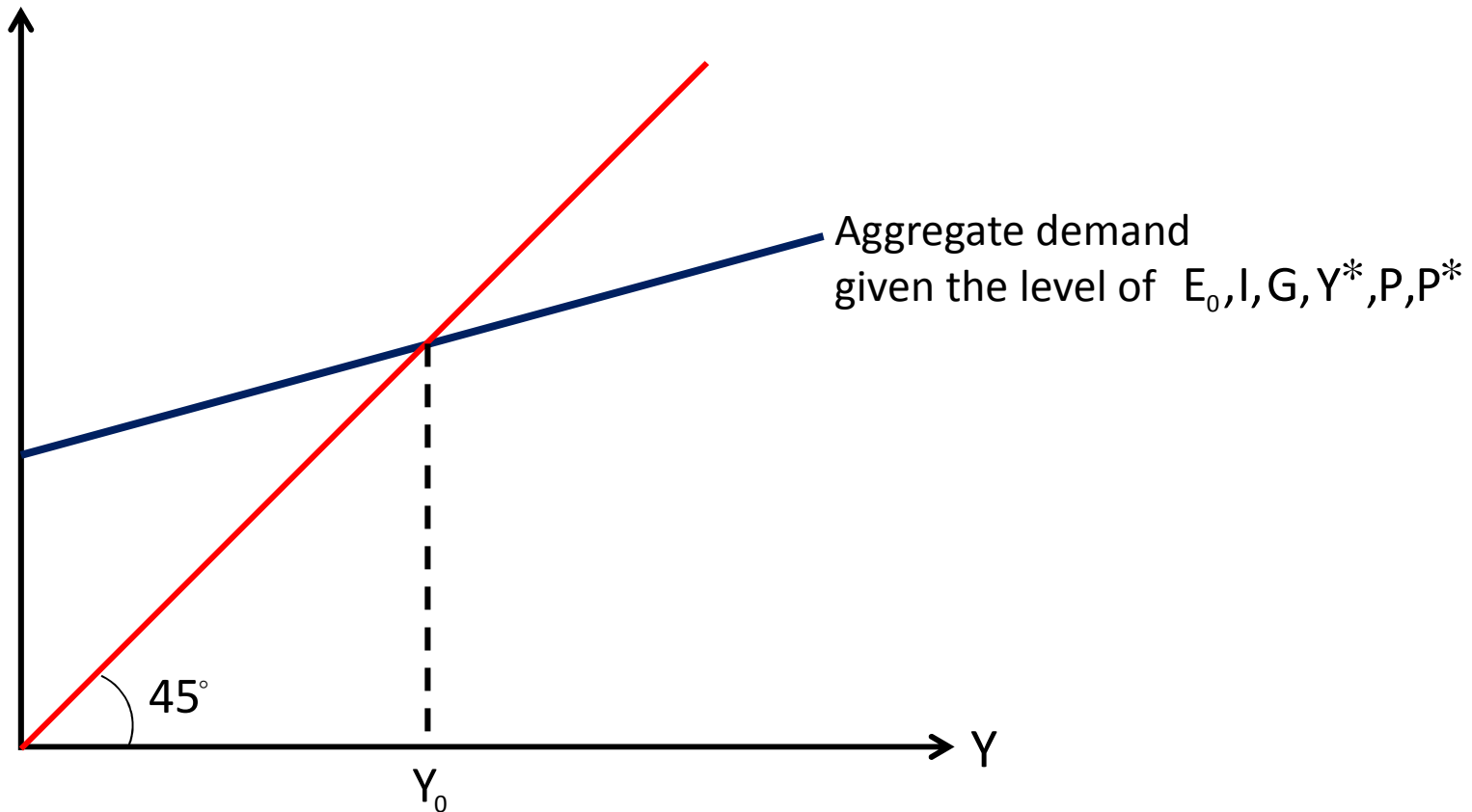


Aggregate Supply Schedule

GDP is the amount of output produced and supplied. Therefore, aggregate supply of domestic output is GDP itself. Aggregate supply schedule – the relationship between GDP and aggregate supply -- is represented by a 45 degree line.



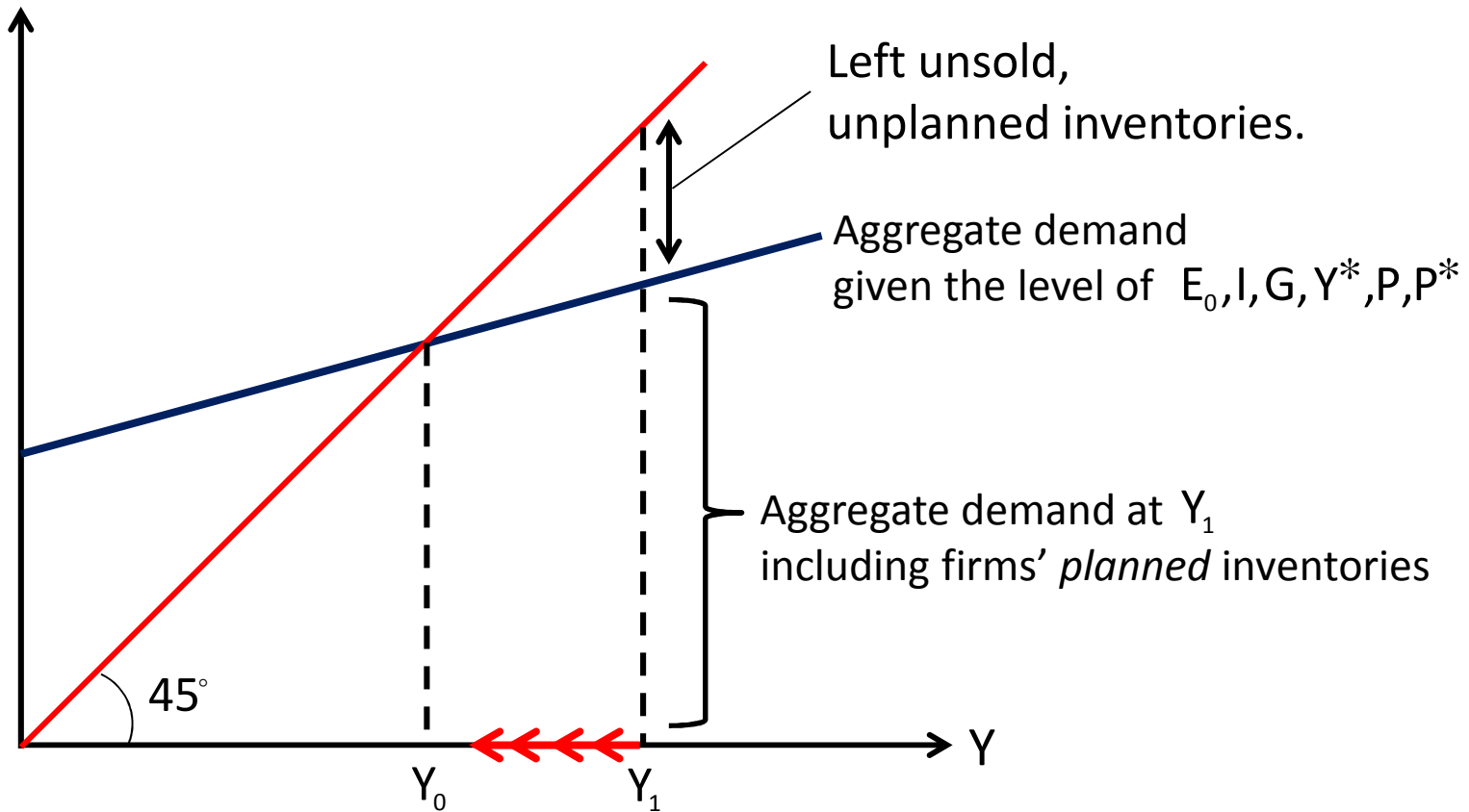
Equilibrium (1)



When GDP is Y_0 , aggregate demand equals aggregate supply.

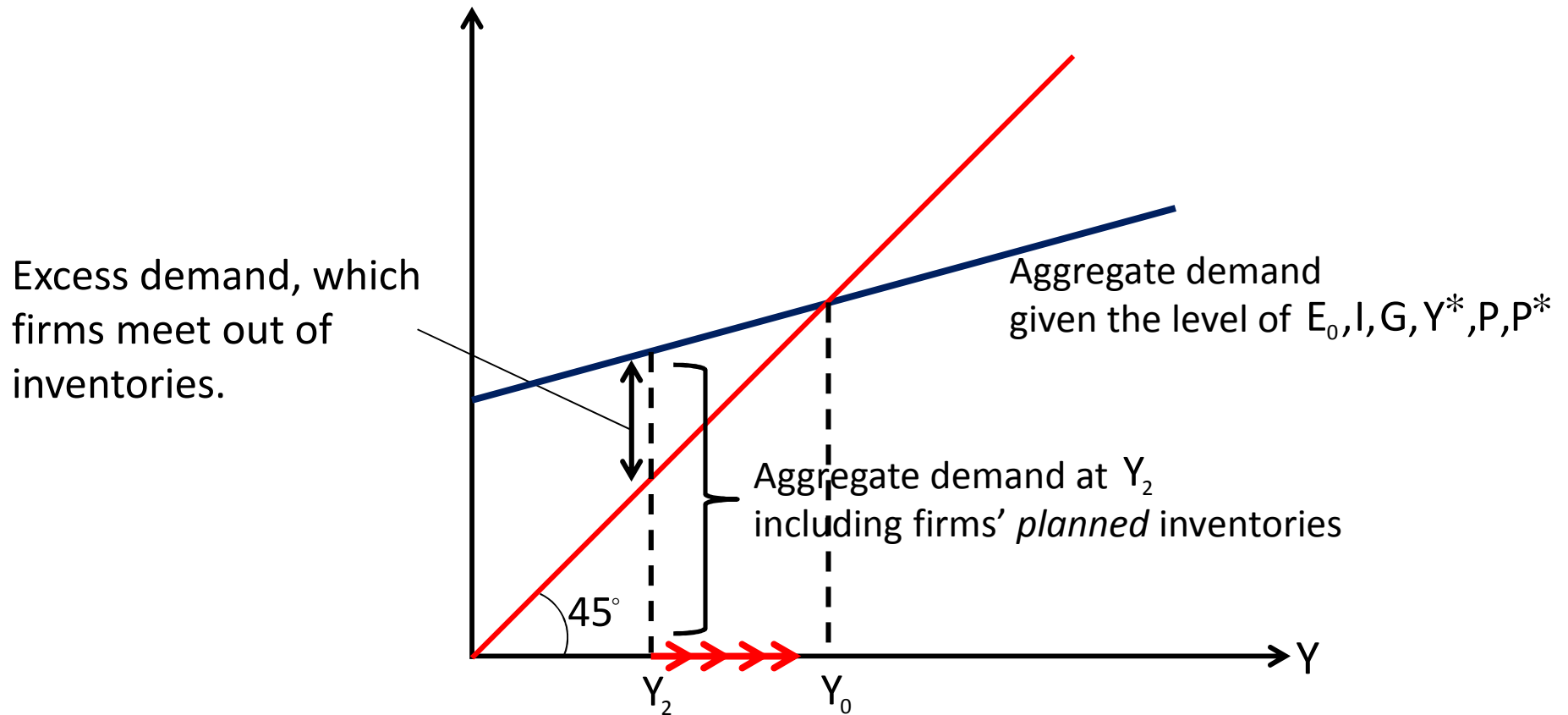
Households, firms, government, and foreign residents are able to purchase just as much as they would like to buy, *and* all the output are sold.

Equilibrium (2)



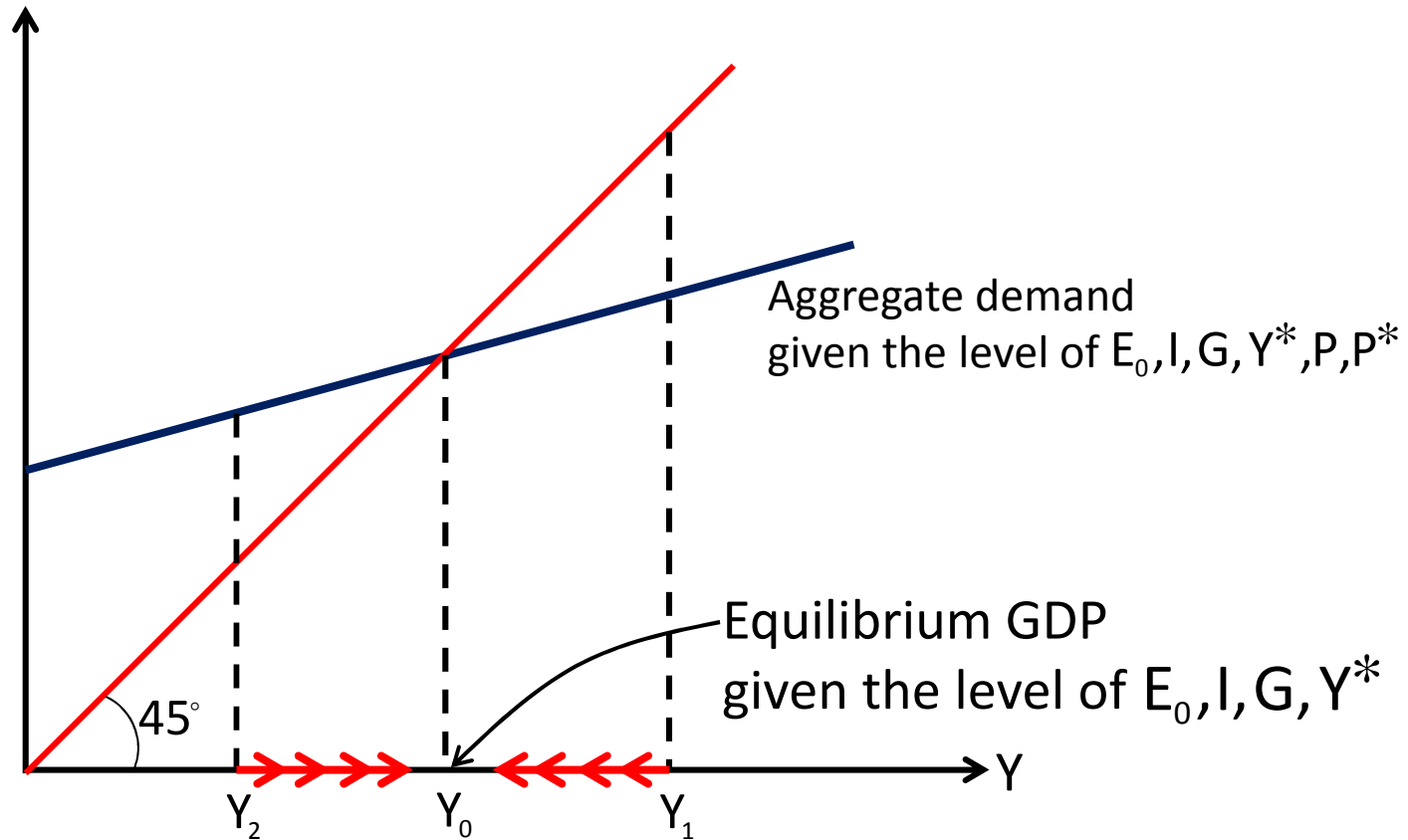
When GDP is Y_1 , aggregate supply exceeds aggregate demand. Firms have unplanned inventories and decrease output.

Equilibrium (3)



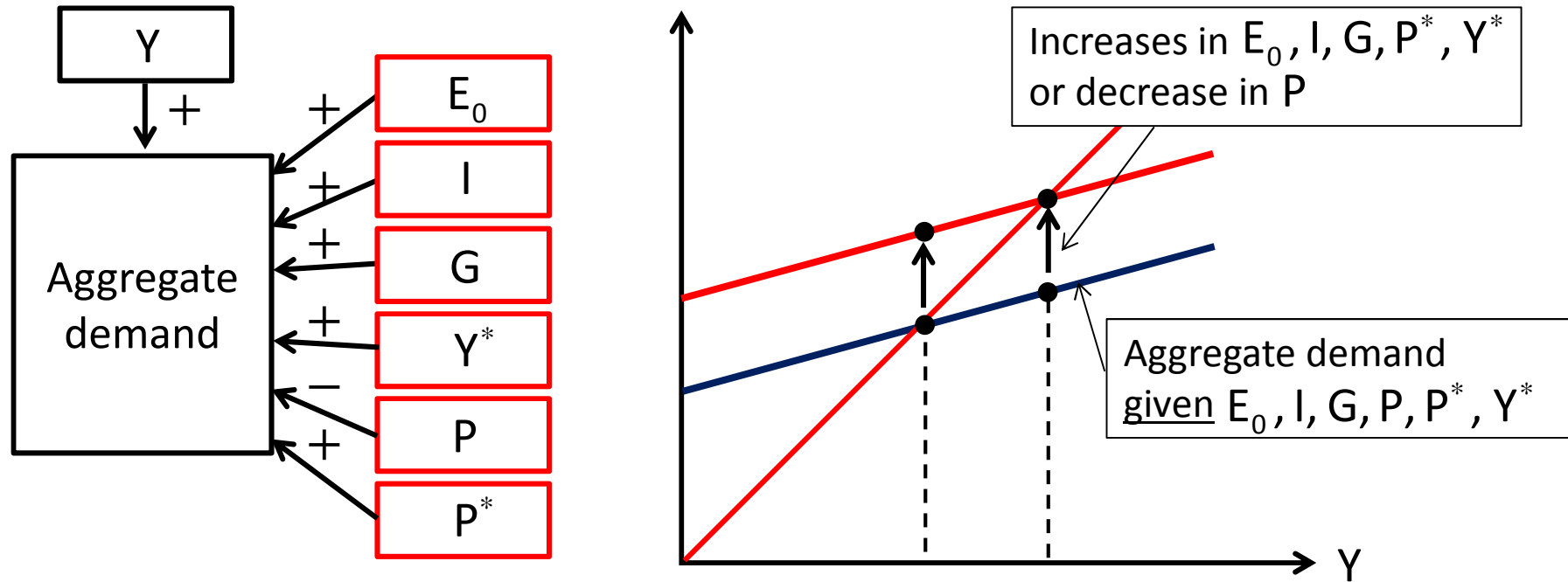
When GDP is Y_2 , aggregate demand exceeds aggregate supply. Firms have fewer inventories than they plan and increase output.

Equilibrium (4)



Given the level of investment demand, government demand, exchange rate, US GDP, Japan's prices, and US prices,
Japan's GDP is determined so that aggregate demand for Japan's output is equal to its GDP.

Shift in Aggregate Demand Schedule



An increase in E_0, I, G, Y^*, P^* or a decrease in P raises aggregate demand for each level of income, shift the schedule upward.

Yen's Depreciation and GDP

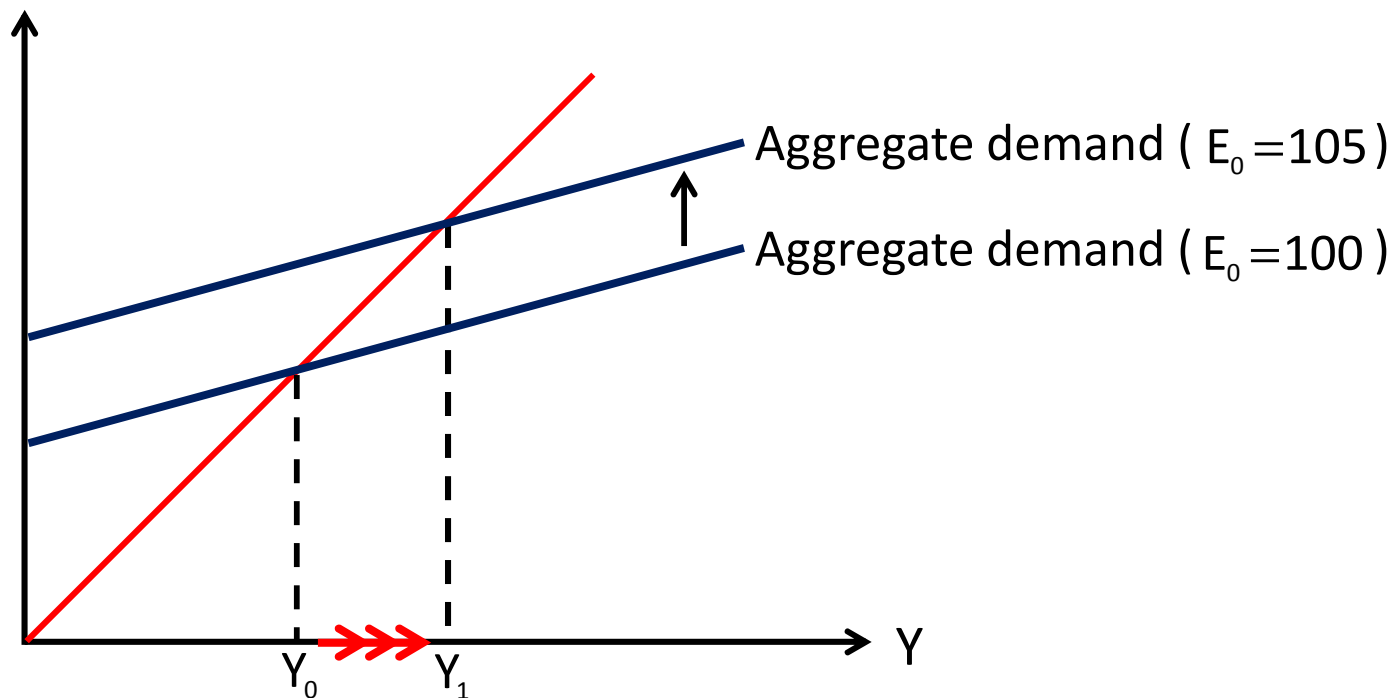
For any level of income, a depreciation of the yen from $E_0 = 100$ to 105 raises the CA balance and raises aggregate demand for domestic output.

GDP	C	I	G	CA	Aggregate Demand
300	180	100	50	30 → 80	360 → 410
400	240	100	50	10 → 60	400 → 450
500	300	100	50	-10 → 40	440 → 490
600	360	100	50	-30 → 20	480 → 530

A depreciation of the yen shifts aggregate demand schedule upward.

Yen's Depreciation and GDP

An increase in the yen/dollar exchange rate raises aggregate demand at every level of income, and raises equilibrium GDP.



Increase in Investment Demand and GDP

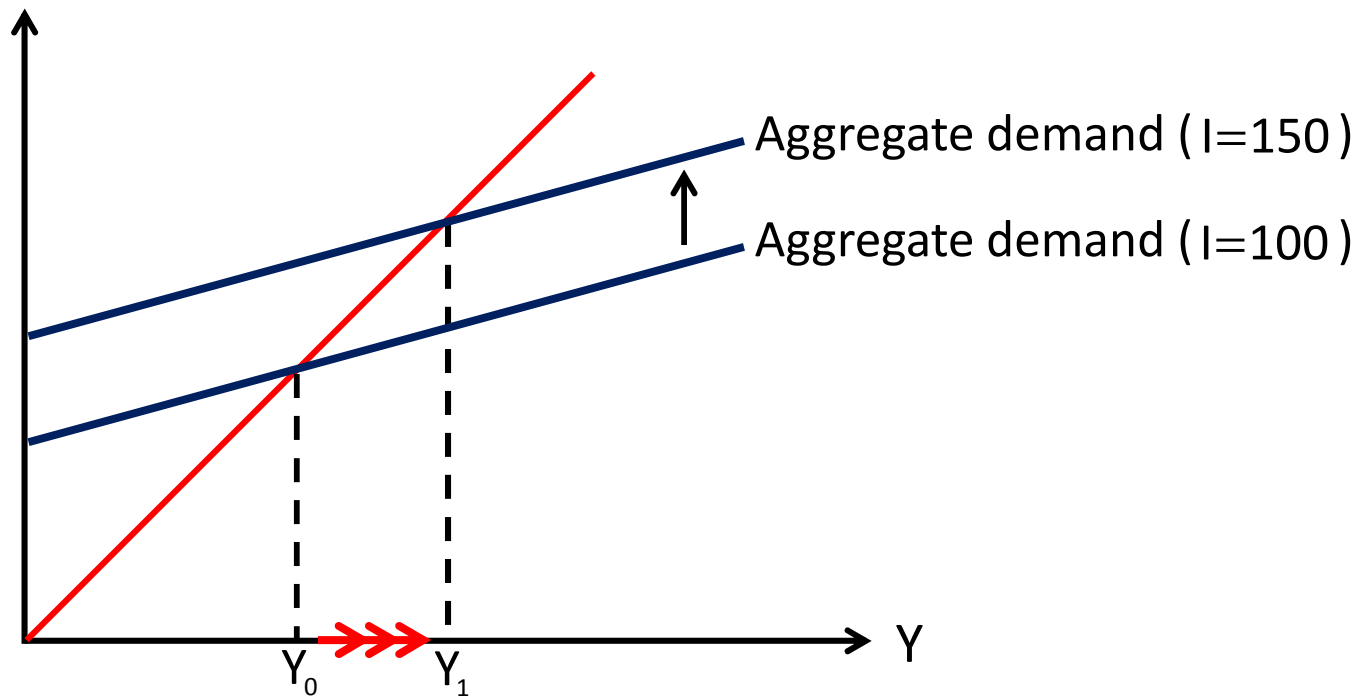
For any level of income, an increase of investment demand from $I=100$ to 150 raises aggregate demand for domestic output.

GDP	C	I	G	CA	Aggregate Demand
300	180	100 → 150	50	30	360 → 410
400	240	100 → 150	50	10	400 → 450
500	300	100 → 150	50	-10	440 → 490
600	360	100 → 150	50	-30	480 → 530

An increase in investment demand shifts aggregate demand schedule upward.

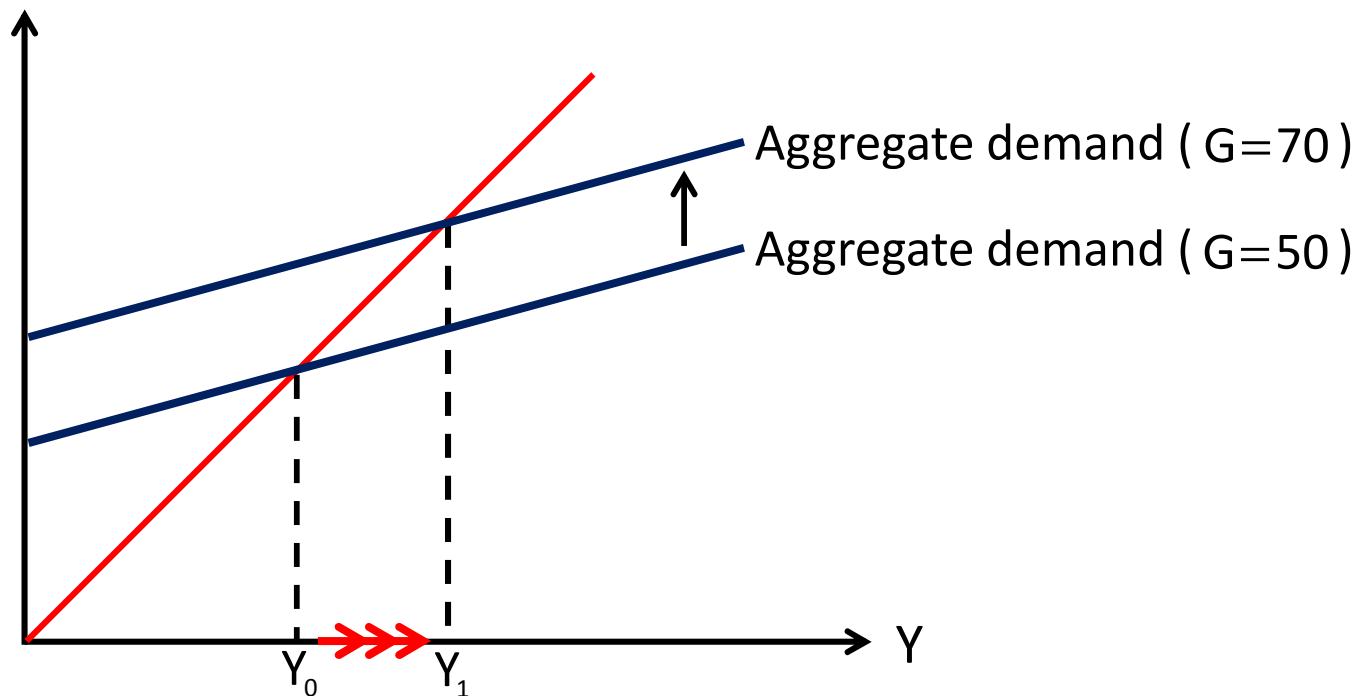
Increase in Investment Demand and GDP

An increase in investment demand raises aggregate demand at every level of income, and raises equilibrium GDP.



Increase in Government Demand and GDP

An increase in government demand raises aggregate demand for Japanese goods at every level of income, just as an increase in investment demand, and raises equilibrium GDP.



Increase in US Income and Japan's GDP

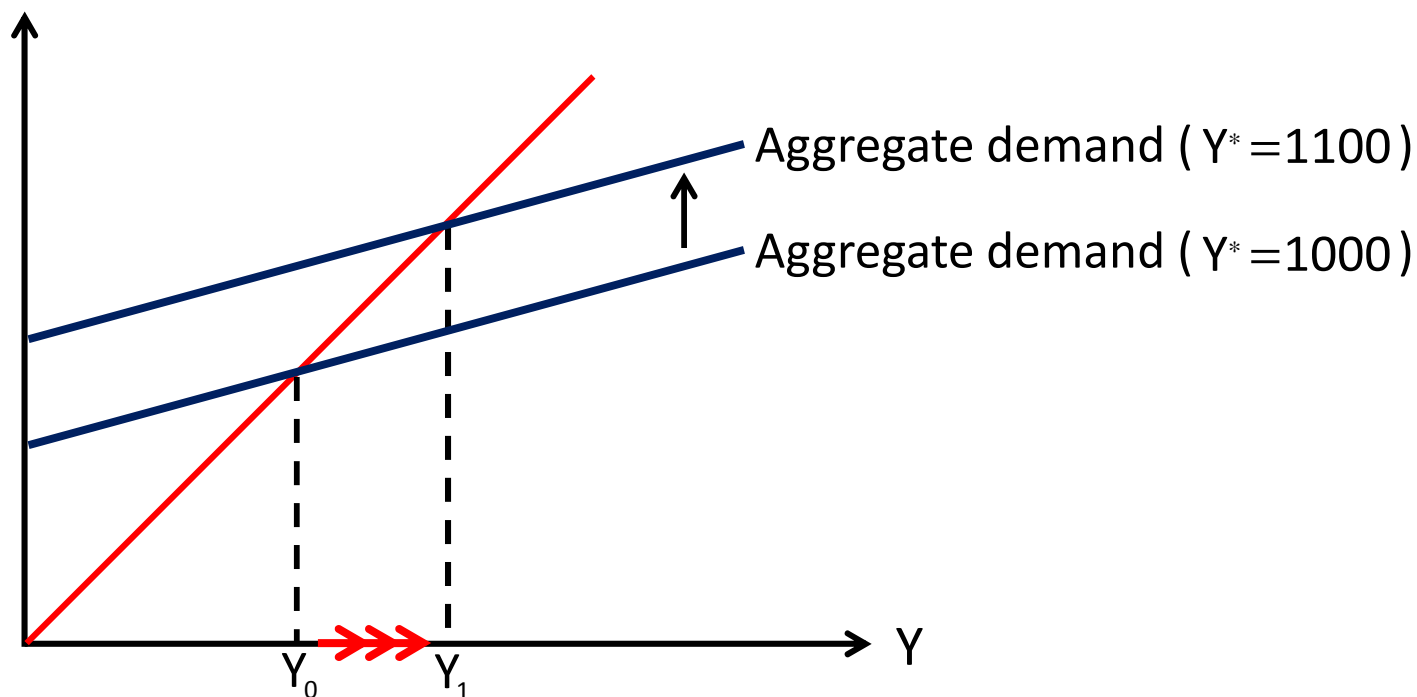
For any level of income, an increase in US GDP from 1000 to 1300 raises US demand for Japanese goods (export demand) and raises aggregate demand for domestic output.

GDP	C	I	G				Aggregate Demand
				EX	IM	CA	
300	180	100	50	60→ 80	30	30→ 50	360→ 380
400	240	100	50	60→ 80	50	10→ 30	400→ 420
500	300	100	50	60→ 80	70	-10→ 10	440→ 460
600	360	100	50	60→ 80	90	-30→ -10	480→ 500

An increase of US income shifts aggregate demand schedule upward.

Increase in US Income and Japan's GDP

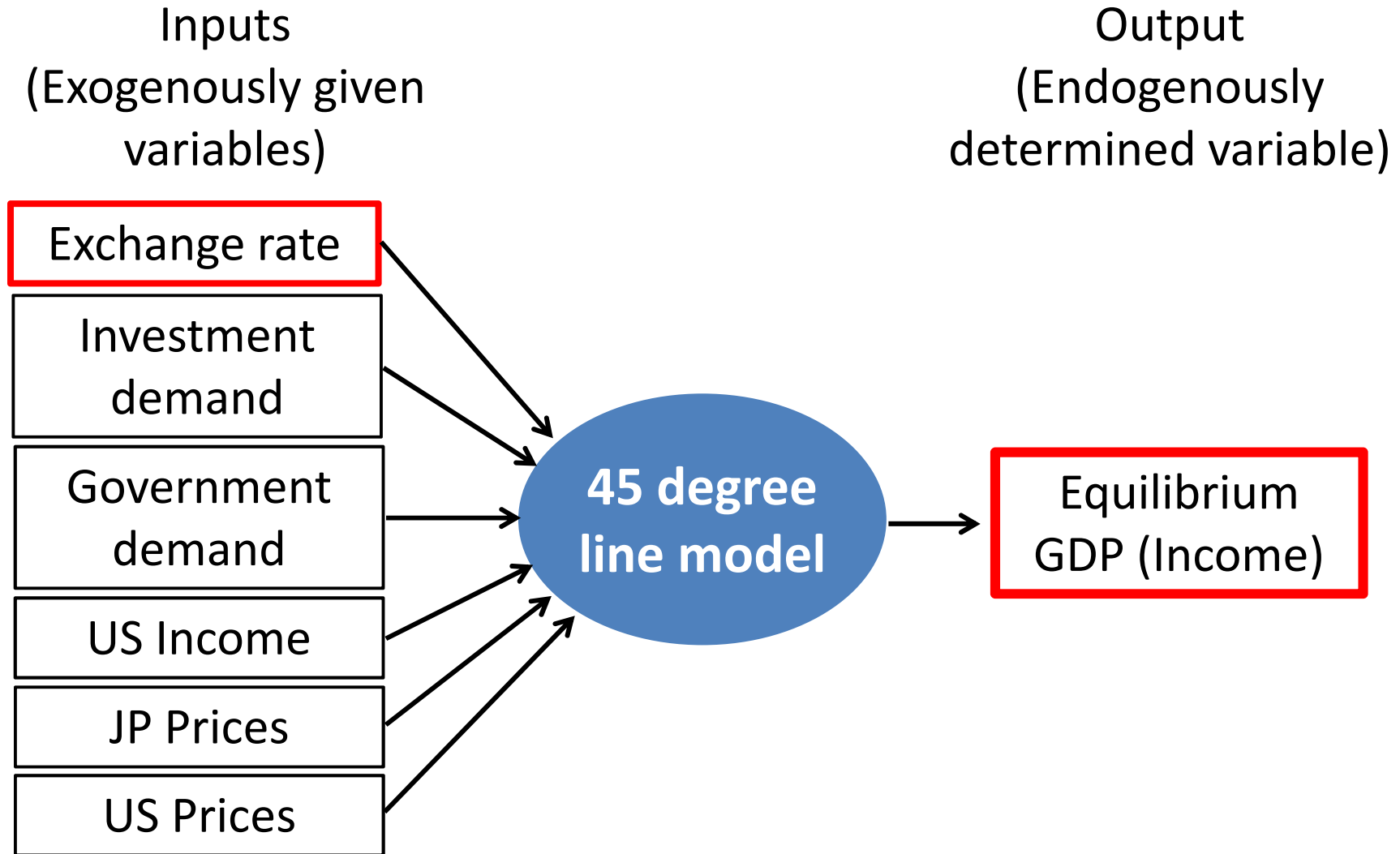
An increase in US income raises aggregate demand for Japanese goods at every level of Japan's income, and raises equilibrium GDP.



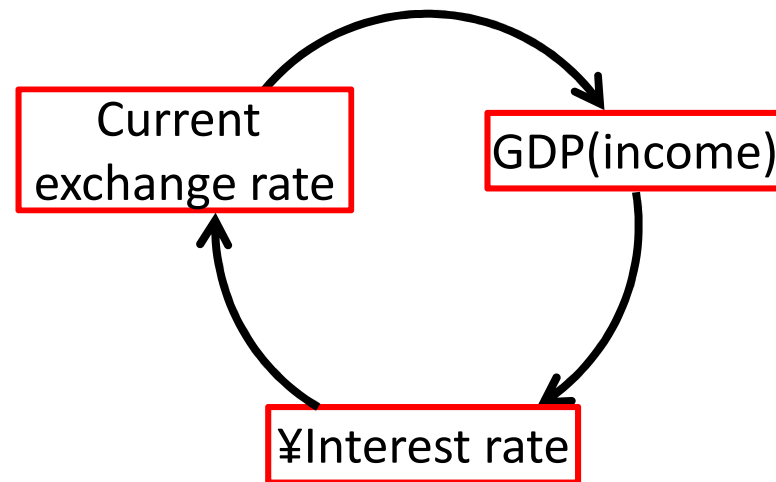
Exercise: Changes in Prices and GDP

1. How does a rise in Japanese prices affect aggregate demand for Japan's output and equilibrium GDP?
Can you draw the graph and explain what happens?
2. How does a rise in US prices affect aggregate demand for Japan's output and equilibrium GDP?
Can you draw the graph and explain what happens?

Model of Goods Market



Simultaneous Determination of Exchange Rate, Interest Rate, and GDP



Three variables affect one another, and are simultaneously determined.

“The DD-AA model” describes how the three variables are simultaneously determined in the medium term, that is, when the price levels are fixed and given from outside.