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

Fall 2012

Lecture 8(Dec 4)
A:Interest Rate (cont.)
B:Determination of GDP

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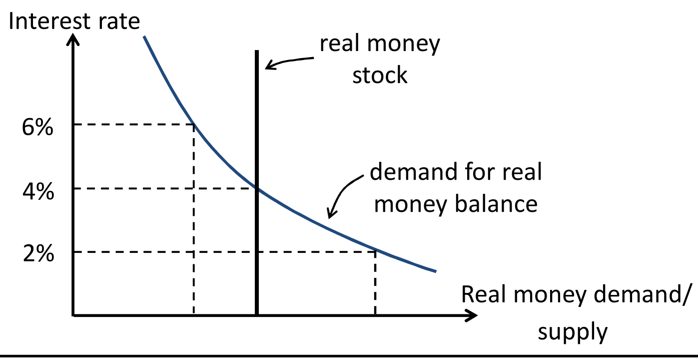
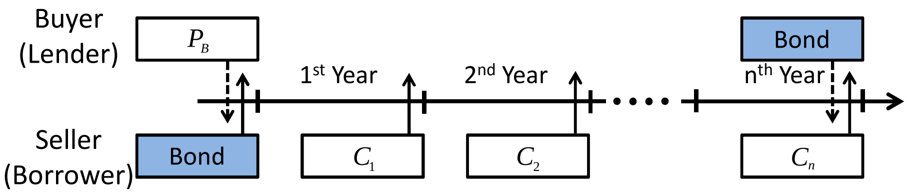
Interest rates, money demand and supply

- The interest rate of bonds are the opportunity cost of holding money.
- The demand for real money balance decreases with the interest rate of bonds.
- The supply of money is determined by the central bank as a tool for monetary policy, and independent of interest rate.



Interest rates and Bond Price

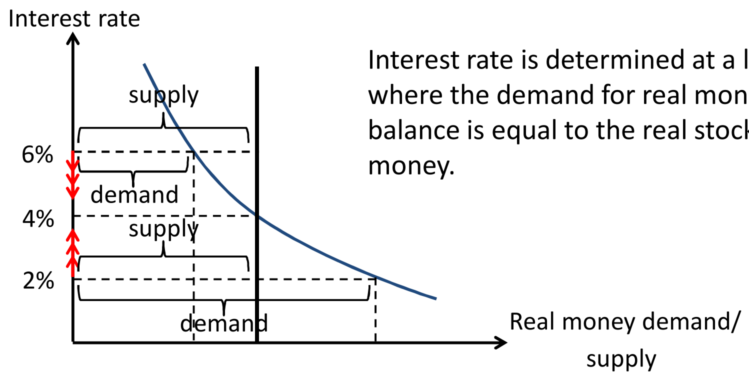


$$\frac{C_1}{1+i} + \frac{C_2}{(1+i)^2} + \cdots + \frac{C_n}{(1+i)^n} = P_B$$

If the stream of payments and the price of a bond are given, the equation gives the interest rate that the bond offers.

As the price of a bond falls, its interest rises.

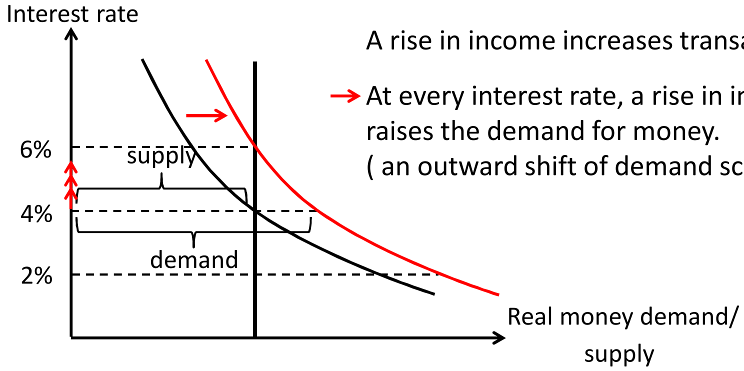
Equilibrium interest rate



Interest rate is determined at a level where the demand for real money balance is equal to the real stock of money.

- At a lower interest rate, people sell bonds for money, pushing the bond price down and the interest rate up toward the equilibrium.
- At a higher interest rate, people buy bonds for money, pushing the bond price up and the interest rate down toward the equilibrium.

Changes in GDP(income)



A rise in income increases transactions.

→ At every interest rate, a rise in income raises the demand for money. (an outward shift of demand schedule)

→ At the initial equilibrium interest rate, people hold less money than they want.

→ A rise(fall) in income raises(lowers) the equilibrium interest rate.

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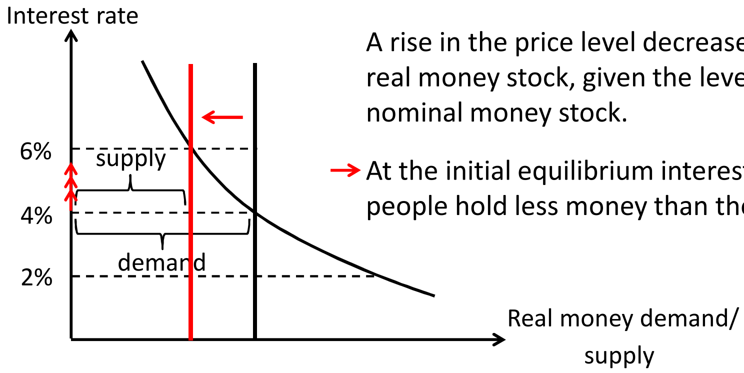
Changes in the Price Level



A rise in the price level decreases the real money stock, given the level of nominal money stock.

→ At the initial equilibrium interest rate, people hold less money than they want.

→ People try to sell their bonds for money.

→ A rise(fall) in the price level raises(lowers) the equilibrium interest rate.

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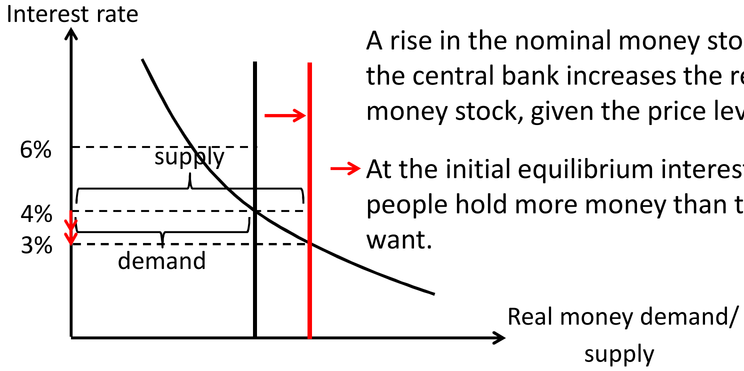
Changes in the (Nominal) Money Stock



A rise in the nominal money stock by the central bank increases the real money stock, given the price level.

→ At the initial equilibrium interest rate, people hold more money than they want.

→ People try to buy bonds for their money.

→ A rise(fall) in the nominal money stock lowers(raises) the equilibrium interest rate.

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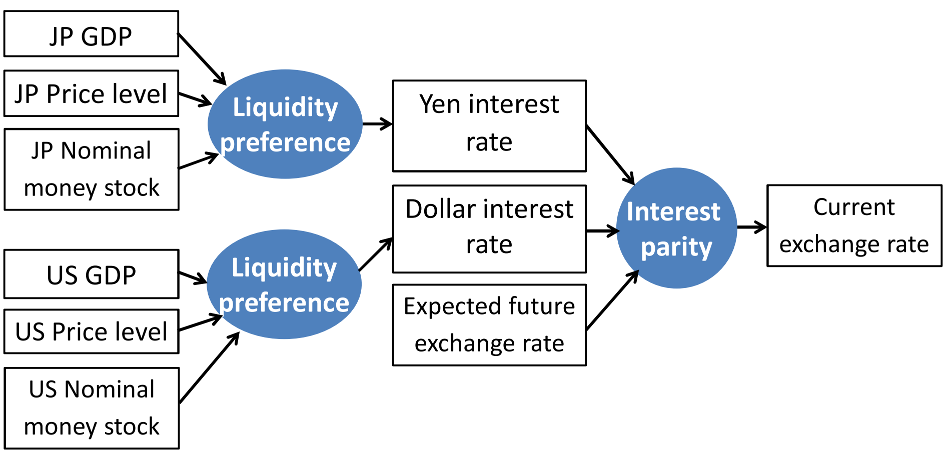
Exchange rates in a wider framework



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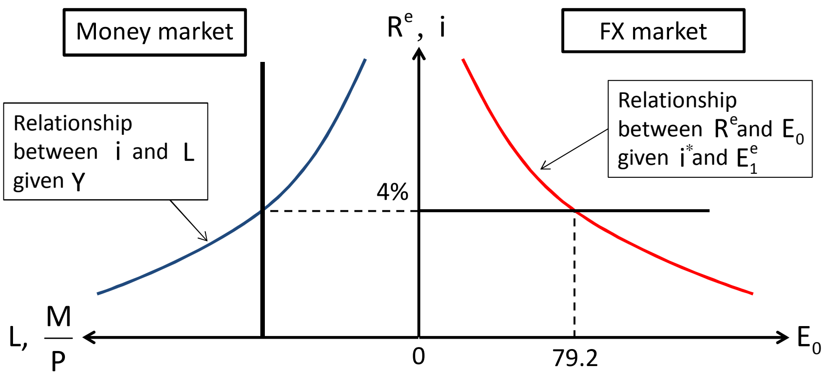
FX market and money market(1)



Given the GDP, the nominal money stock, and the price level, money market determines the yen interest rate (Left panel).

Given the yen interest rate, the dollar interest rate, and the expected future exchange rate, FX market determines the current exchange rate (Right panel).

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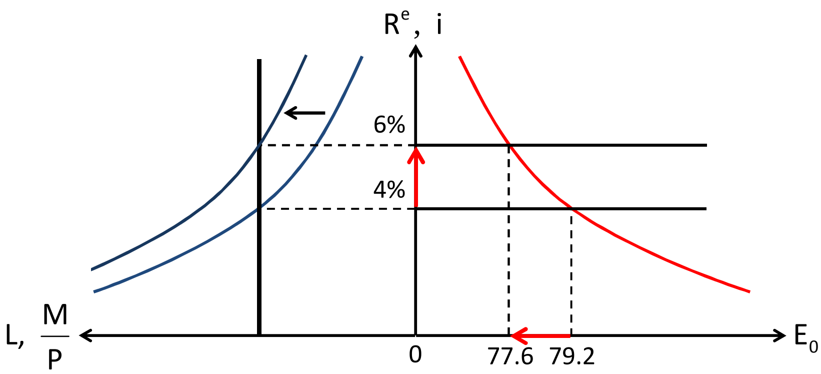
FX market and money market(2)



An increase in the Japan's GDP raises the equilibrium yen interest rate (Left panel).

The increase in the yen interest rate causes the yen to appreciate against the dollar (Right panel).

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Exercises

Examine how the equilibrium yen/dollar exchange rate is affected by

1. a rise/fall in the Japan's GDP
2. a rise/fall in the Japan's nominal money stock
3. a rise/fall in the Japan's price level
4. a rise/fall in the US GDP
5. a rise/fall in the US nominal money stock
6. a rise/fall in the US price level

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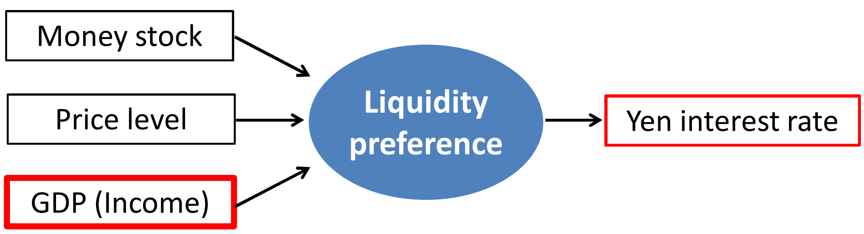
The model of interest rate

Inputs
(Exogenously given variables)

Output
(Endogenously determined variable)



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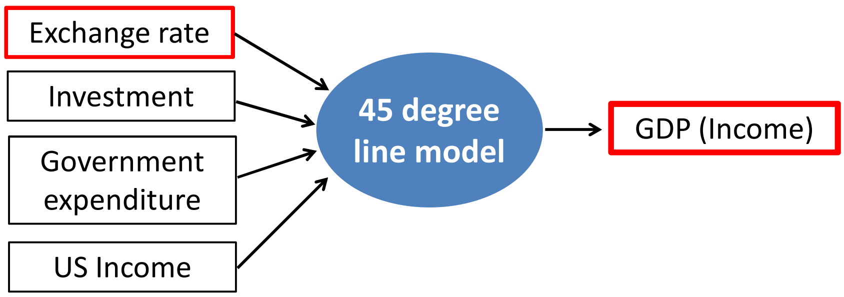
The model of GDP

Inputs
(Exogenously given variables)

Output
(Endogenously determined variable)



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A Note on the flexibility of prices

Exchange rate, <u>the price of a currency</u>, changes and adjusts the demand and supply of the currency.

Interest rate (or <u>price of a bond</u>) changes and adjust the demand and supply of money (or bond).

Prices of goods/services do **not** respond flexibly to the demand and supply of goods/services.

In the short-run, prices of goods/services are not as flexible as exchange rates or interest rates, and assumed to be fixed.

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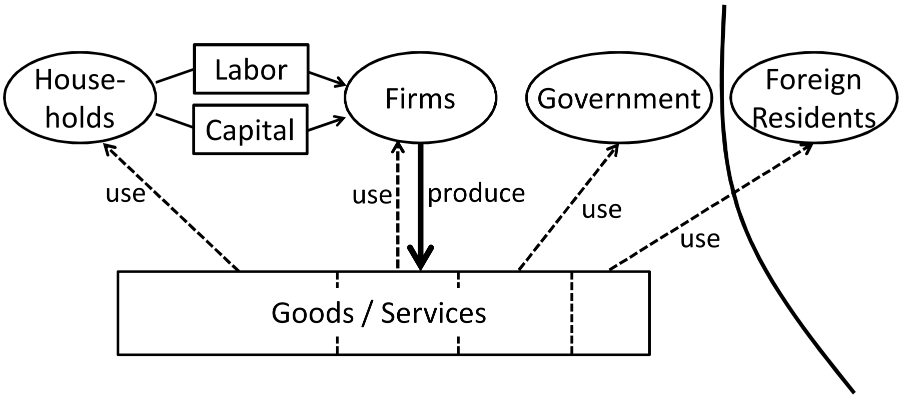
Components of the aggregate demand



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Aggregate demand for goods/services

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

1. **Consumption demand (C)**
   Household's demand for domestic goods/services
2. **Investment demand (I)**
   Firm's demand for domestic goods/services
3. **Government demand (G)**
   Government's demand for domestic goods/services
4. **Trade Balance (TB)**
   Net foreign demand for domestic goods/services

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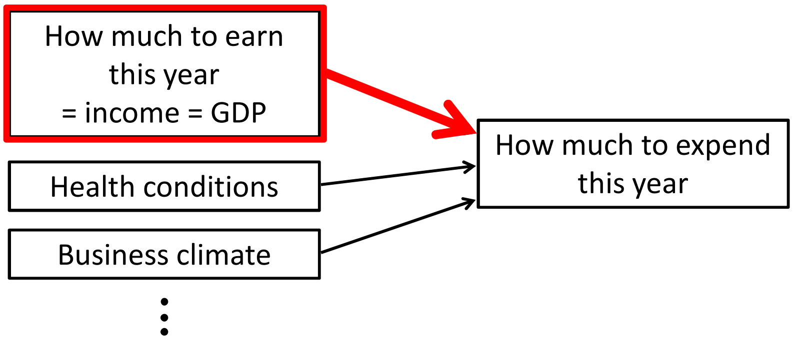
Consumption demand



The consumption expenditure is mainly affected by the national income, GDP.

The consumption demand increases less than the income increases, because part of the income increase is <u>saved</u>.

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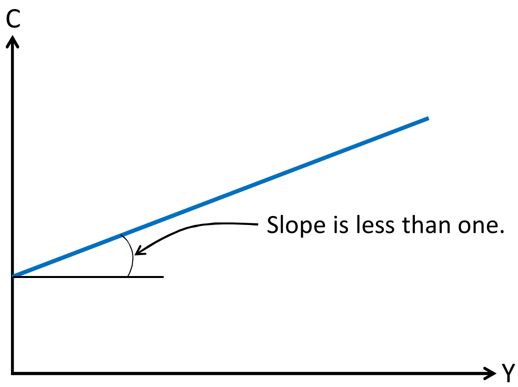
Consumption demand



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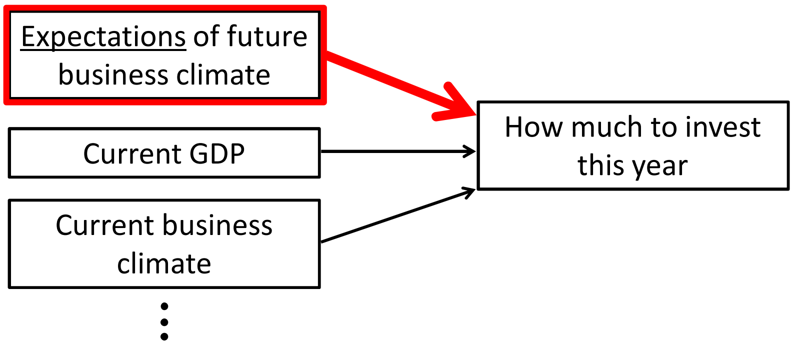
Investment demand



Firms buy machine tools, buildings, or inventories for future production or sales.

The investment demand is independent of the current GDP.

A more complex model might assume that the investment depends also on the cost of borrowing for investment, the interest rate.

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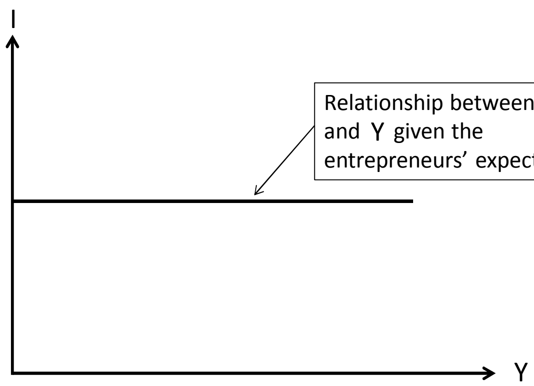
Investment demand



At every level of GDP, the investment is fixed at a certain level determined by the entrepreneurs' expectation of the future.

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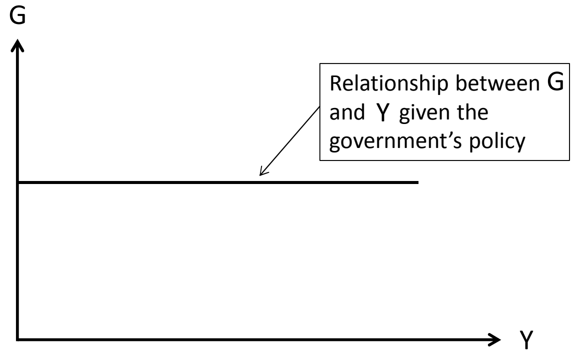
Government Expenditure



The government determines its expenditure based on policy consideration, independent of the GDP.

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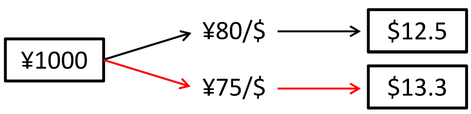
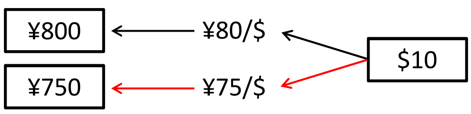
Export and import demand

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



An appreciation of the yen raises the dollar prices of the Japanese goods.

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



An appreciation of the yen lowers the yen prices of the US goods.

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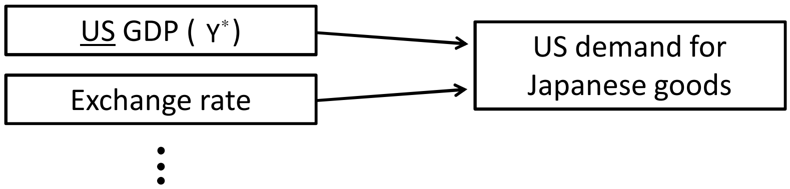
Export - US Demand for Japanese Goods



The US demand for the Japanese goods depends on
(1)the US income, and
(2)the yen/dollar exchange rate through changes in the dollar prices of the Japanese goods.

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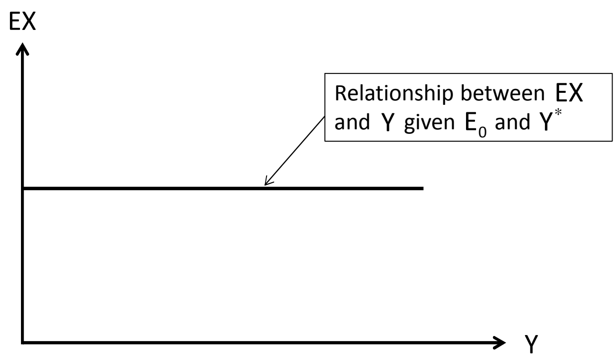
Export demand



With the exchange rate and the US GDP constant,
export demand is constant at every level of the Japan's GDP.

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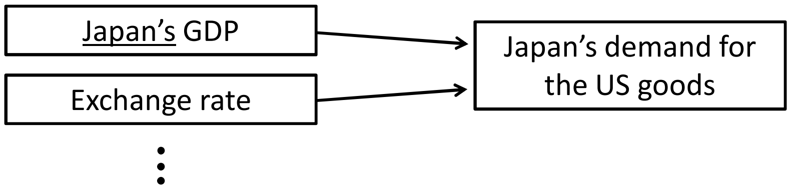
Import – Japan’s Demand for US Goods



The Japan’s demand for the US goods depends on
(1)the Japan’s income, and
(2)the yen/dollar exchange rate through changes in the yen prices of the US goods.

Import increases less than the income increases, because part of the income increase is spent on domestic goods.

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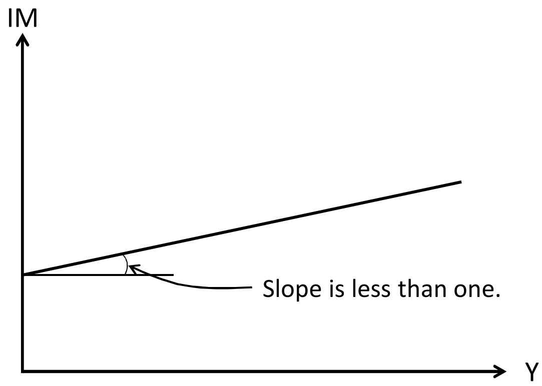
Import demand



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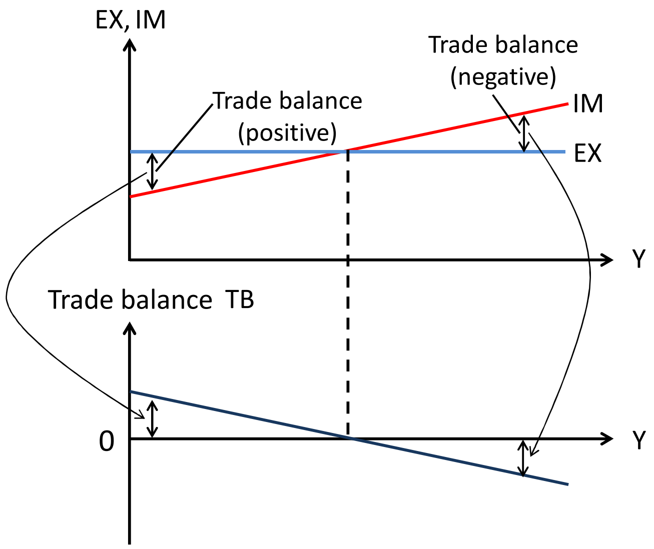
Trade balance (Net export demand)



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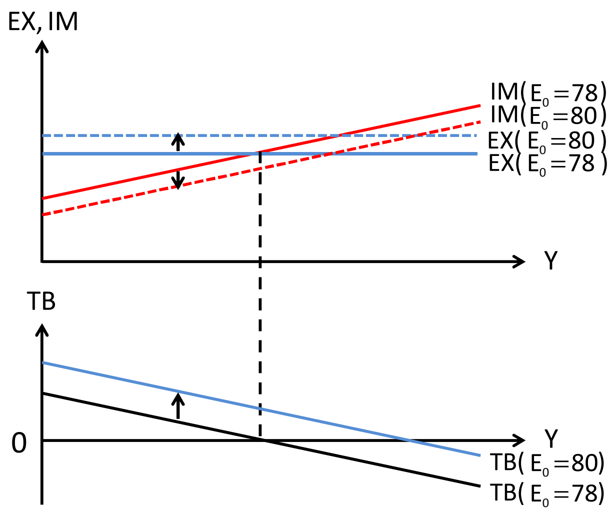
Trade balance and exchange rate



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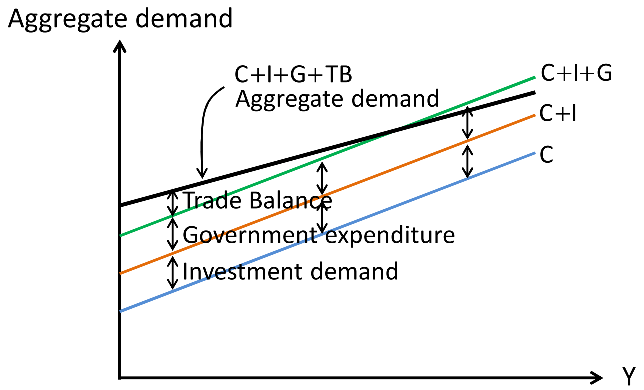
Aggregate demand for goods



The graph shows the relationship between the aggregate demand for the Japanese goods and the Japan's GDP, given the level of exchange rate, investment, government expenditure and the US GDP.

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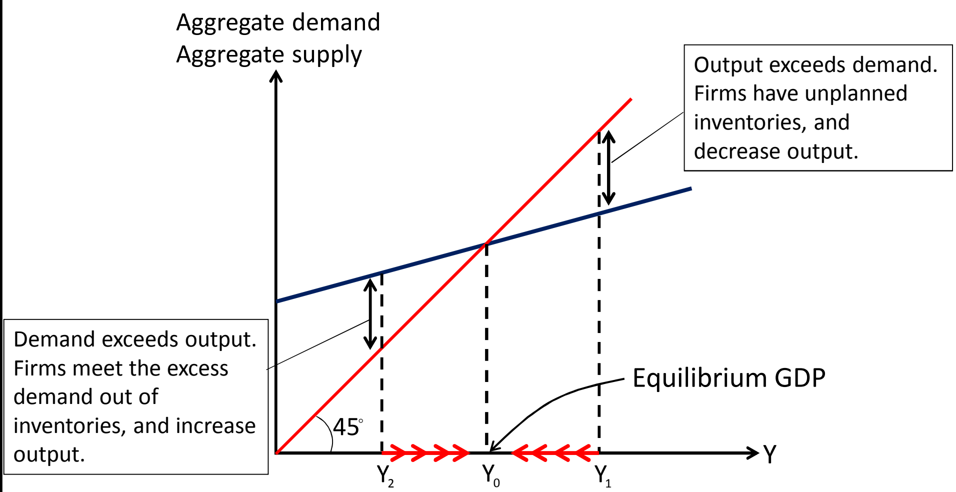
Equilibrium in the market for goods



Given the level of investment, government expenditure, the US GDP and exchange rate, the Japan's GDP is determined at a level where the aggregate demand are equal to the aggregate supply.

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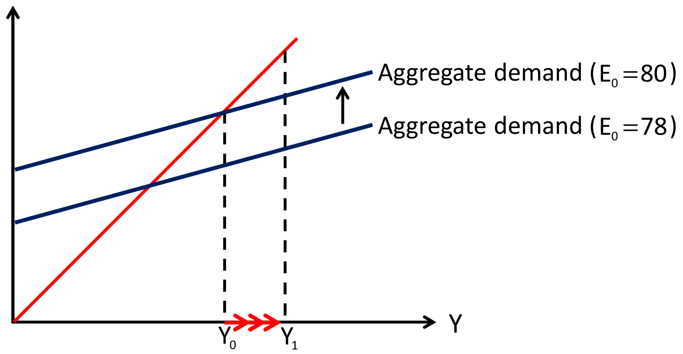
Changes in the equilibrium GDP(1)

An increase in the yen/dollar exchange rate raises net export demand for the Japanese goods/services at every level of output.

An increase in the yen/dollar exchange rate raises the aggregate demand at every level of output.



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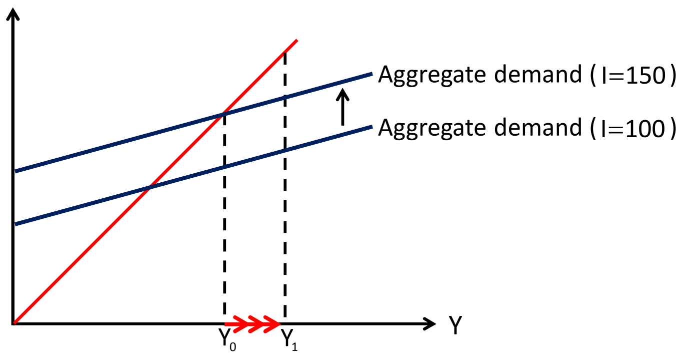
Changes in the equilibrium GDP(2)

An increase in investment demand raises the aggregate demand for the Japan's goods/services at every level of output.



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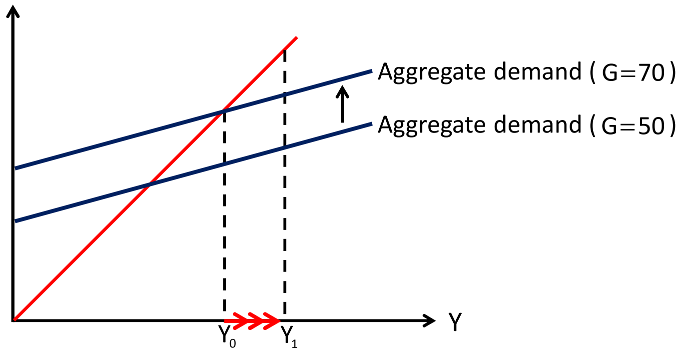
Changes in the equilibrium GDP(3)

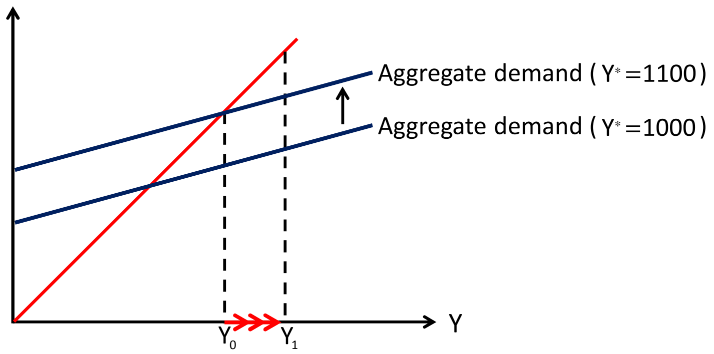
An increase in government expenditure raises the aggregate demand for the Japan's goods/services at every level of output.



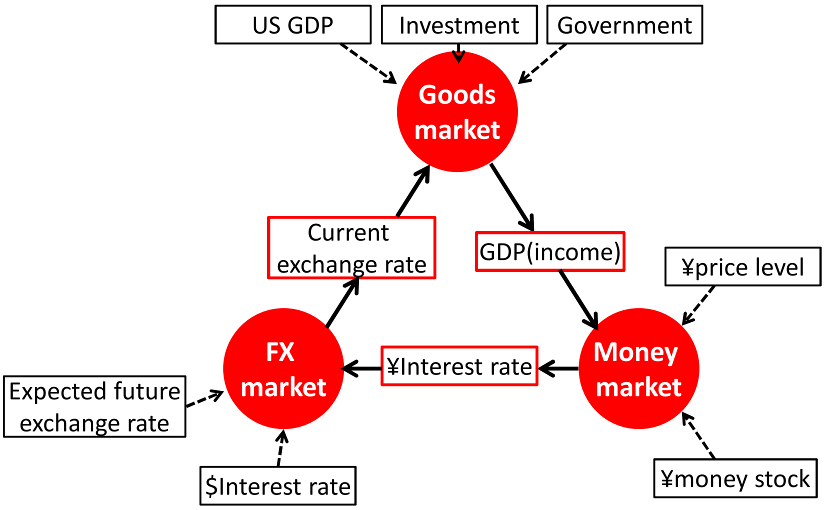
Changes in the equilibrium GDP(4)

An increase in the US GDP raises the US demand for the Japanese goods/services at every level of Japan's output.

An increase in the US GDP raises the aggregate demand for the Japanese goods/services at every level of Japan's output.



Exchange rates in a much wider framework



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