Lecture 3 Notes

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1. Aggregate Expenditure (AE)
   (a) John Maynard Keynes analyzed the short run relationship between the aggregate expenditure and GDP in his book, "*The General Theory of Employment, Interest, and Money*" (1936)
   (b) There is a fall in spending and production during a recession
   (c) To explain the business cycle including recession, we must understand the components of aggregate expenditure
   (d) The aggregate expenditure equation consists of four components:
      i. $AE = C + I + G + NX$
      ii. Aggregate expenditure is composed of expenditure by households (C), expenditure by firms (I), expenditure by government (G), and expenditure by foreigners minus domestic consumers (NX)
   (e) The Components in Detail:
      i. Consumption (C)
         A. An expenditure on goods and services by households and is the highest part of aggregate expenditure (70%)
         B. Consists of spending on nondurables, durables, and services
         C. Factors that influence consumption:
            - Disposable personal income (current income)
              - DPI is the amount of income that is available for consumption after tax (adjustable income)
              - $DPI = PI - T$, where PI is personal income, and T is the income tax
              - Personal income = GDP + transfer payments + interest payments - retained earnings
              - Transfer payments are government spending on social welfare to households (ex. unemployment insurance, social security, disability insurance, etc.)

  - Interest payments are households' interest income from holding government bonds
  - Retained earnings are the earnings from stocks that are reinvested to firms instead of paying back to stockholders as dividends
  - There is a positive relationship between DPI and consumption, ceteris paribus
  - The positive relationship between the two is shown as positive marginal propensity to consume
  - The marginal propensity to consume (MPC) is the increase in consumption as a result of increase in DPI by $1, and ranges between 0 and 1
- Wealth
  - The value of assets minus the value of liabilities
  - Asset is anything of value owned by a person (ex. saving account, stocks, bonds, real estate, etc.)
  - Liability is anything of value owed by a person (ex. mortgage loans, car loans, credit card debts)
  - There is a positive relationship between wealth and consumption, ceteris paribus (with higher savings, households tend to consume more)
- Expected income (future income)
  - If people expect their income to rise, they consume more from borrowing money or savings
  - If people expect their income to fall, they consume less in order to save money
  - There is a positive relationship between expected income and current consumption (ex. current consumption drops due to uncertainties from COVID-19)
- Price level
  - Inflation causes consumption to drop because people will have less purchasing power
  - Deflation leads to higher consumption because people will have higher purchasing powers
  - There is a negative relationship between price level and consumption
- Interest rate
  - Interest rate is a cost of borrowing and the price of money paid by borrowers
  - Interest rate is also a return on saving and the price of money received by savers
  - Increase in interest rate will raise the cost of borrowing and lower consumption, especially on durables

- There is a negative relationship between interest rate and consumption

2. Consumption Function

   (a) A function that shows the relationship between consumption and DPI (Y) assuming wealth, expected income, price level, and interest rate are constant (ceteris paribus)

   (b) $C = a + bY$, where a is the autonomous consumption (consumption when DPI = 0), and b is the marginal propensity to consume (MPC), which is a change in consumption as a result of change in DPI by \$1. $b = \frac{C_1 - C_0}{Y_1 - Y_0}$ = slope

   (c) Assume that DPI = GDP (Y) or transfer payments + interest payments = retained earnings + income tax

3. Investment

   (a) The expenditure on goods and services by firms

   (b) It occupies similar proportion of aggregate expenditure as the government spending (20%)

   (c) It consists of non-residential fixed investment (structures, equipment, and intellectual properties), residential fixed investment (new houses bought by households), and change in inventories

   (d) Factors that influence investment:

      i. Expected profit (income)

         A. Firms will spend more money on non-residential investment if it is expected to earn higher profit

         B. Households will spend more money on residential fixed investment if they are expected to have higher income

         C. There is a positive relationship between expected profit or income and investment

      ii. Interest rate

         A. Firms will borrow less money for non-residential fixed investment if the interest rate is high

         B. Households will borrow less money for residential fixed investment if the interest rate is high

         C. There is a negative relationship between interest rate and investment

      iii. Property (corporate) tax

         A. Firms will spend less money on non-residential fixed investment if a corporate tax rises

         B. Households will spend less money on residential fixed investment if the property tax or income tax rises

C. There is a negative relationship between tax and investment

iv. Investment credit

A. Firms will spend more money on non-residential fixed investment if investment credit rises

B. Households spend more money on residential fixed investment if there is an investment credit for buying new houses

C. There is a positive relationship between investment credit and investment

v. Cash flow

A. The cash revenue minus cash cost

B. Profit is the largest portion

C. Depreciation is not a cash cost since firms are not paying for it by cash

D. Firms will spend more money on non-residential fixed investment if they have more cash flow

E. There is a positive relationship between cash flow and investment

vi. Price level

A. Change in price level indirectly influences investment through change in interest rate

B. With inflation, people demand more money, which will result in increase in interest rate in the money market, and lower investment

C. With deflation, people demand less money, which will result in decrease in interest rate in the money market, and increase investment

D. There is a negative relationship between price level and investment

4. Government purchases

(a) An expenditure on goods and services by the government

(b) Occupies a similar proportion of aggregate expenditure as investment (20%)

(c) Consists of spending by state, local, and federal governments

(d) The government decides how much it will spend according to citizens' needs

(e) In the short run, government purchases are not directly affected by income, wealth, interest rate, price level, and so on

(f) We assume that the government purchases are fixed over GDP or do not depend on GDP

(g) Transfer payments such as unemployment insurance and social security benefits are excluded in GDP because the government receives nothing in return

5. Net export

(a) It is exports minus imports

(b) Factors that influence net export:

i. Domestic income
   A. Increase in domestic income leads to an increase in import and decrease in net export
   B. There is a negative relationship between domestic income and net export

ii. Foreign income
   A. Increase in foreign income leads to an increase in export and increase in net export
   B. There is a positive relationship between foreign income and net export

iii. Exchange rate
   A. Exchange rate is the value of one currency expressed in terms of another currency, normally $: foreign currency
   B. Appreciation (increase in exchange rate)
      - ex. from $1:1000 Korean won to $1:1200 Korean won
      - Domestic products become more expensive, and export will decrease
      - Foreign products become cheaper, and import will increase
      - As a result, net export will decrease
   C. Depreciation (decrease in exchange rate)
      - ex. from $1:1000 Korean won to $1:800 Korean won
      - Domestic products become cheaper, and export will increase
      - Foreign products become more expensive, and import will decrease
      - As a result, net export will increase
   D. There is a negative relationship between exchange rate and net export

iv. Preferences for foreign goods
   A. When tastes for foreign goods increase or people find foreign goods more attractive, domestic consumers will buy more of foreign goods and import will increase and net export will decline
   B. There is a negative relationship between tastes for foreign goods and net export

v. Trade policies
   A. The effects of trade policies, such as free trade, tariffs, or import quota are reflected in exchange rates and other macroeconomic variables rather than influencing the net export directly
   B. The effects of trade policies on net export can be analyzed on a case by case basis

vi. Price level
   A. Change in price level indirectly affects net export through change in exchange rate
   B. With inflation, domestic products will become more expensive and exchange rate will rise (appreciate) because the value of domestic currency will increase, resulting in decrease in net export

C. With deflation, domestic products will become cheaper and exchange rate will decline (depreciate) because the value of domestic currency will decline, resulting in increase in net export

6. Actual vs. Planned Aggregate Expenditure

   (a) Actual aggregate expenditure (Y = GDP) is the amount of spending and production that the economy has already made, whereas planned aggregate expenditure (PAE) is the amount of spending and production that the economy is planning to make

   (b) If PAE > Y, there is a decrease in inventories because fewer products are produced than necessary

   (c) If PAE < Y, there is an increase in inventories because more products are produced than necessary

   (d) If PAE = Y, there is no change in inventories because products are produced exactly as needed

7. Aggregate Expenditure Function

   (a) It is a function that shows the relationship between planned aggregate expenditure (PAE) and actual aggregate expenditure (GDP = Y)

   (b) The aggregate expenditure is composed of four components: consumption, investment, government purchases, and net export

   (c) $AE = C + I + G + NX$

   (d) Consumption is composed of two parts: autonomous consumption and non-autonomous consumption — $C = a + bY$

   (e) Manipulating the function gives us:

      i. $AE = (a + I + G + NX) + bY \Rightarrow AE = d + bY$, where d is the autonomous AE, which is an AE that does not depend on income, and is composed of autonomous consumption, investment, government purchases, and net export (the Y-intercept of the curve), and bY is the non-autonomous AE, which does depend on income, and is composed of non-autonomous consumption (slope of the curve)

8. Macroeconomic (Keynesian) Equilibrium

   (a) Keynes explained the macroeconomic equilibrium using two lines: planned aggregate expenditure (PAE) and a 45 degree line that shows PAE = Y, which means whatever is produced in the economy is consumed (no change in inventories)

   (b) Macroeconomic equilibrium occurs when there is no incentive to change or deviate in the economy

   (c) It occurs when the PAE is equal to total production (Y) at the intersection between the AE curve and a 45-degree line

(d) The GDP at this point is called macroeconomic equilibrium GDP

(e) If PAE > Y, there is a decrease in inventories, and GDP will increase to equilibrium

(f) If PAE < Y, there is an increase in inventories, and GDP will decrease to equilibrium

9. Potential GDP and Business Cycle

(a) Potential GDP or output (Y_p) is a GDP where there is no cyclical unemployment, a GDP where there is only the natural rate of unemployment, or a GDP at the full employment/capacity

(b) The most ideal GDP that an economy can reach

(c) The government uses this as a policy goal that the economy is supposed to reach

(d) About 4% in the US, on average

(e) A business cycle (recession and expansion) occurs when the PAE curve shifts due to change in any non-income determinants of PAE (macroeconomic conditions)

i. Recession occurs when the equilibrium GDP (Y_E) < potential GDP (Y_p)

ii. Occurs when any non-income determinants of PAE will shift the PAE curve right

iii. Occurs when wealth, expected profit, cash flow, or foreign income declines

iv. Occurs when interest rate, tax, exchange rate, tastes for foreign products, or price level rises

v. The difference between equilibrium GDP and potential GDP is the recessionary output gap ($Y_p - Y_E$)

(f) Expansion occurs when the equilibrium GDP (Y_E) > potential GDP (Y_p)

i. Occurs when any non-income determinants of PAE shift the PAE curve left

ii. Occurs when wealth, expected profit, cash flow, or foreign income rises

iii. Occurs when interest rate, tax, exchange rate, tastes for foreign products, or price level declines

iv. The difference between equilibrium GDP and potential GDP is the inflationary output gap ($Y_E - Y_p$)

10. The Aggregate Demand and Aggregate Supply Model

(a) Represents the relationship between GDP and price level for the economy, whereas demand and supply model represents the relationship between the price and quantity for a product

(b) GDP is the sum of the market values of all goods and services produced in the economy and represents the total production or total income for the economy

(c) The price level is the weighted average price of all the goods and services in the economy and is measured by GDP deflator, PPI, or CPI

11. Aggregate Demand Curve

    (a) The aggregate demand is the total quantity of goods and services demanded in the economy at each given price level and is measured by the aggregate expenditure (AE) from the expenditure approach

    (b) The aggregate demand curve is a curve that shows the relationship between price level and GDP

    (c) The price level is measured by CPI, PPI, or GDP deflator, which is a weighted average price of all goods and services in the economy

    (d) Changes in the price level influence the aggregate demand in three ways:

        i. Wealth Effect (Real-Balance Effect)
        ii. Interest Rate Effect
        iii. Exchange Rate Effect (International Trade Effect)