Keynesian model of income determination (basic)

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Introduction

- Previously, we measured the gross domestic product (GDP) by using three approaches: the expenditure approach, the income approach, and the production approach.
- Here, I show you that in a macroeconomic equilibrium: aggregate income, aggregate production, and aggregate demand are all equal.
- Here, in theory, we will discuss the **equilibrium determination** of aggregate demand, aggregate production, and aggregate income.

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Key assumptions

- We make the simple assumption that all firms in the economy produce a similar good, which is then used for personal consumption (C), for private investment by firms (I), and for government consumption (G).
- We assume that prices are fixed, and firms are willing to supply an infinite amount of the good at a given price (this is premise behind competitive markets, all firms take the price as given).
- For simplicity, we make a simple assumption that we have a closed economy (net export is zero).

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Aggregate expenditures (consumption)

- **Consumption** (C) measures private expenditures (households' expenditures) on goods (both non-durable and durable) and services. A simple and linear *behavioral consumption function* can be described as follows

$$C = c_a + mpc(Y - T) \tag{1}$$

where Y is total income and T denotes taxes paid adjusted for transfers. The **marginal propensity to consume** (mpc) is always positive and less than 1. mpc captures the extra consumption that arises from an additional dollar increase in **disposable income**. c_a is **autonomous consumption** or the the level of private consumption that would prevail if disposable income was zero.

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Aggregate expenditures (investment)

- **Private investment expenditures** (I) tracks both private fixed investment (residential and non-residential) and change in private inventories. Here, investment expenditures are treated as fixed or **exogenous** (determined outside of the model). The investment function can be modeled as follows

$$I = I_a \tag{2}$$

where I_a denotes the level of **autonomous investment spending**; or in other words, the level of investment expenditures that would prevail if production or income was equal to zero.

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Aggregate expenditures (government)

- **Government expenditures** (G) is the last component of the basic model. The latter does not include **government transfers** (for example, unemployment benefits and social security transfers). Government expenditures are also treated as **exogenous** and can be modeled as follows

$$G = G_a \tag{3}$$

where G_a denotes **autonomous government spending**; or in other words, the level of government spending that prevails in the economy, regardless of the level production or total income.

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Aggregating expenditures

- **Aggregate demand** (E) can be estimated by taking the sum of personal consumption expenditures, gross private domestic investment expenditures, government expenditures as follows

$$E = C + I + G \tag{4}$$

where the components of aggregate demand or expenditures include: $C = c_a + mpc(Y - T)$, $I = I_a$, and $G = G_a$. Using the latter and simplifying equation (4) yields the following

$$E = \{c_a + I_a + G_a - mpcT\} + mpcY$$

where $\{A_e = c_a + I_a + G_a - mpcT\}$ is the part of demand that does not depend on output or income: **autonomous expenditures**.

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Goods market equilibrium

- **Equilibrium in the goods market** requires that **production** (Y) be equal to **aggregate demand** or expenditures for goods. This latter condition is denoted as follows

$$Y = E \tag{5}$$

where in equilibrium, aggregate production (Y), aggregate demand (E), and aggregate income (Y) are all equal. Inserting (E) into equation (5) yields the equilibrium level of income or production as follows

$$Y = \left(\frac{1}{1 - mpc}\right)\{c_a + I_a + G_a - mpcT\} \tag{6}$$

where $\left(\frac{1}{1-mpc}\right)$ denotes the **multiplier effect** for this economy.

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Goods market equilibrium

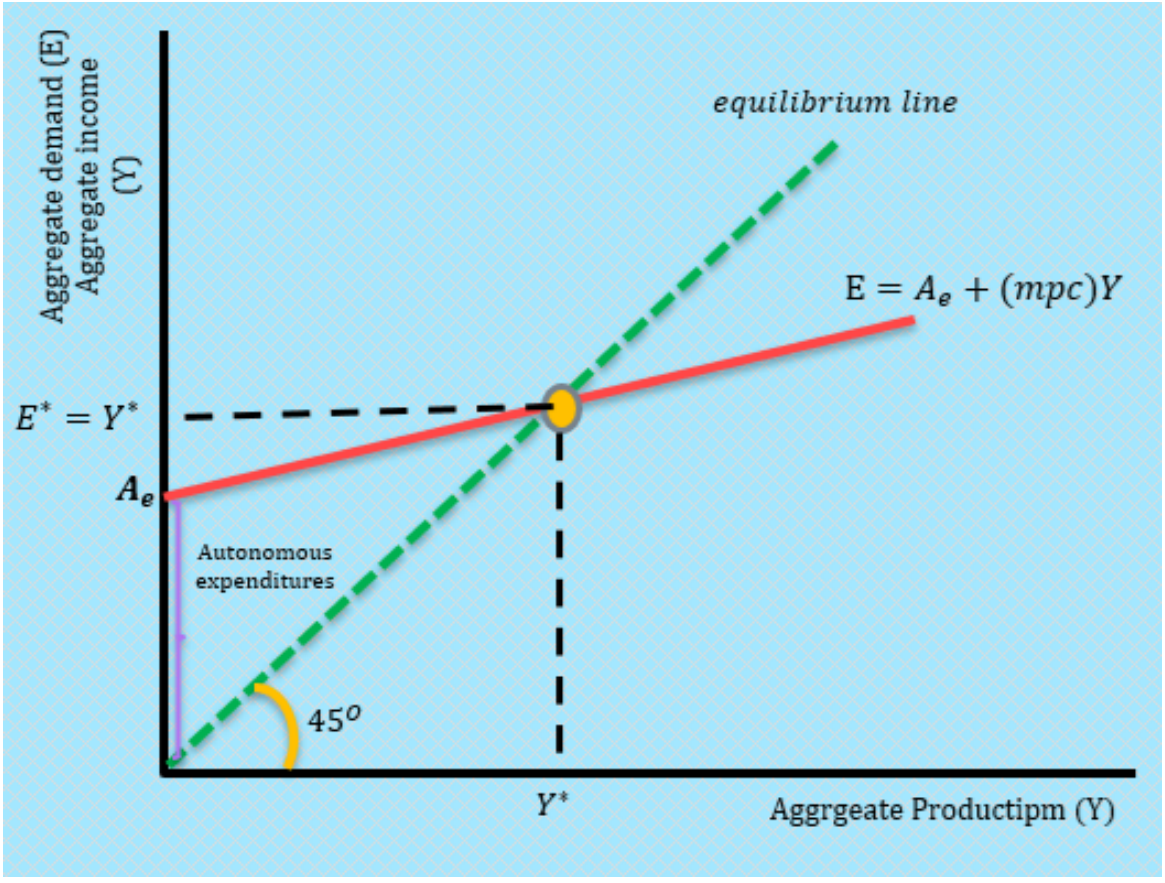

Figure: Keynesian Income Determination (Full Model)