

# Identities and Equations in Macroeconomics

Dr. Siby Abraham  
sibyabraham@shcollege.ac.in

# Identity - Definition

- Identities are mathematical statements or equations that are true in definitional form. It represents an equality between functions that are differently defined.
- When an equation is satisfied for all values of variable forming the expressions, it is termed as an identity. Thus it is a special case of an equation. In other words all identities are equations but not all equations are identities.
- Identities are also called ‘accounting relationship’ and represented with ‘triple bar’ ( $\equiv$ ).

# Equations - Definition

- Equations are mathematical statements that emphasises the equality between two mathematical expressions. An equation is true only for particular values of the variables in the equation.
- Unlike identities, variables cannot take any values to keep the equation true. The values of these variables are found out by solving the equation.
- Equations are also called ‘behavioural relationships’ and it relates two expressions by an equality sign (=).

# Identity - Example

- Consider the simple macroeconomic model:  $Y = C + I + G + (X-M)$
- This model becomes a true representation of the economy because of its definitional correctness. As such it is also called as the national income identity and is represented as:

$$Y \equiv C + I + G + (X-M)$$

- The true numerical values of the variables in the right hand side of the identity may or may not be equal to the left hand side of the equation in a numerical sense and there can be small discrepancies. But definitionally the right hand side is equal to the left hand side and hence called as identity.

# Equation - Example

- Consider the following equations:

$$\rightarrow 28 = 2z + 10$$

Here the equation is true only for a particular value of  $z$  (ie,  $z = 9$ ).

$$\rightarrow C = C_0 + bY$$

Where,  $C$  is the magnitude of consumption spending,  $C_0$  is the autonomous consumption spending corresponding to a zero level of income,  $b$  is the consumption-income ratio and  $Y$  is the level of income. This equation is based on the empirical observation of the consumption behaviour.

## Suggested Readings:

1. Diwedi DN: Macroeconomics Theory and Policy|| Tata McGraw-Hill
2. Edward Shapiro: Macroeconomics - Oxford University press.
3. Gregory Mankiw: Macroeconomics – 6th Edn. Tata McGraw Hill.
4. [www.soas.ac.uk/cedep-demos/000\\_P542\\_EP\\_K3736-Demo/unit1/page\\_25.htm](http://www.soas.ac.uk/cedep-demos/000_P542_EP_K3736-Demo/unit1/page_25.htm)