Lesson Goal

- Understand the steps in econometric modeling.

Introduction

- **Econometrics** literally means economic <u>measurement</u>.
- 'Mathematics' and 'Statistics' with 'Economic Theory'.

Econometrics is a social science in which the tools of economic theory, mathematics and statistical inference are applied to the analysis of economic phenomena (Arthur, 1964).

Arthur S. Goldberger, Econometric Theory, John Wiley & Sons, New York, 1964, pp. 1

Methodology of Econometrics

Traditional/Classical Methodology:

- ➤ **Statement of Theory or Hypothesis**
  - ● Theory of Demand (Law of Demand)
    - ○ Quantity demand is inversely related to price (ceteris paribus).

  - ● Consumption Theory
    - ○ Consumption is positively related to income.

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Specification of Mathematical Model**
- **Consumption Theory**
  - Consumption is positively related to income.

$$C = a + bY$$

where: C = Consumption expenditure

Y = Income

a and b are parameters (intercept and slope)

a is autonomous consumption and b is MPC.

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Specification of Econometric Model**

$$\underline{Y} = \underline{\boldsymbol{\beta}_1} + \underline{\boldsymbol{\beta}_2}X + u \qquad [\underline{C} = \underline{a} + \underline{b}Y]$$

Unobserved Factors
(size of the family, employment level, etc.)

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Obtaining the data**

- Data could be obtained from databases or any other relevant source.
- E.g. Ghana Statistical Service

Methodology of Econometrics

Traditional/Classical Methodology:

- ➤ Estimate the Econometric Model

$$Y = \beta_1 + \beta_2 X + u$$

$$\beta_1 = 18.57 \qquad \beta_2 = 4.96$$

$$Y = 18.57 + 4.96X$$

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Hypothesis Testing**

- Test for significance of parameters estimated.

$$Y = 18.57 + 4.96X$$

Is $\beta_1 = 18.57$ significant?

$H_0: \beta_1$ (not significant)
$H_a: \beta_1$ (significant)

Is $\beta_2 = 4.96$ significant?

$H_0: \beta_2$ (not significant)
$H_a: \beta_2$ (significant)

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Forecasting and Prediction**

$$Y = 18.57 + 4.96X$$

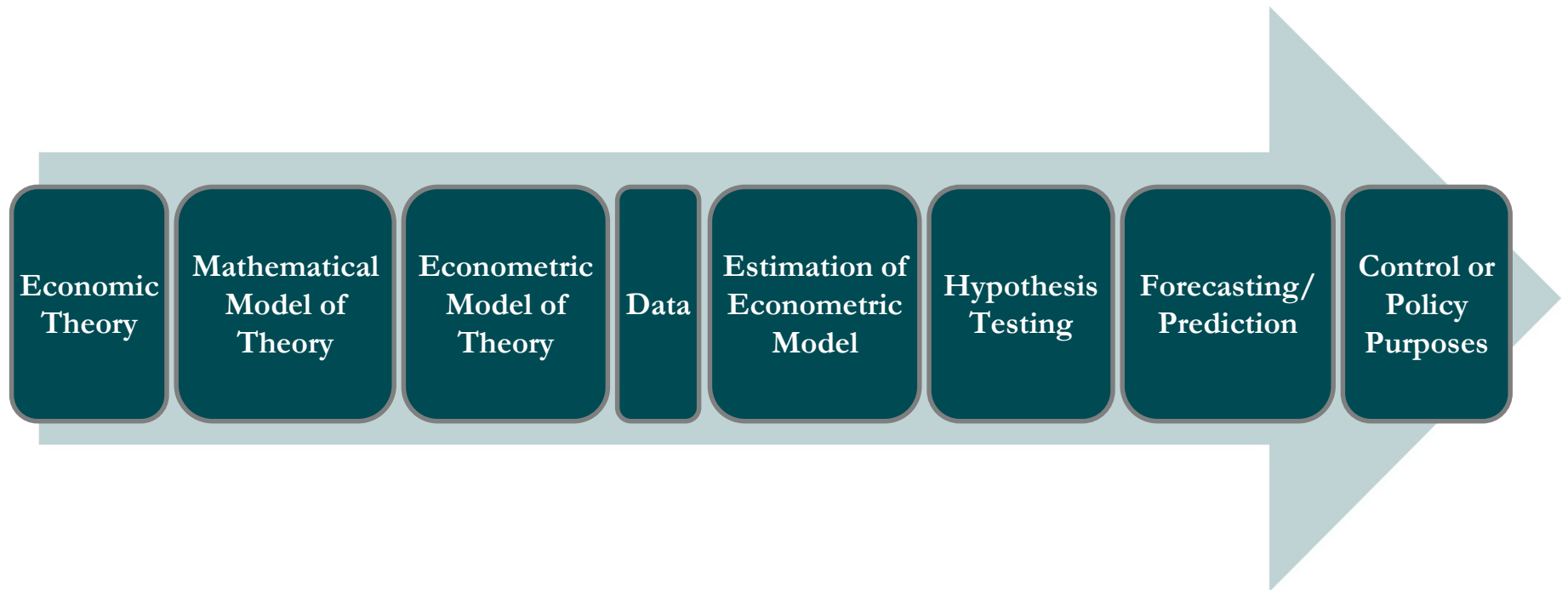If $X = 100$, $\quad Y = 18.57 + 4.96(100) = 514.57$

If $X = 150$, $\quad Y = 18.57 + 4.96(150) = 762.57$

Methodology of Econometrics

Traditional/Classical Methodology:

➢ **Use the Model for Control or Policy Purposes**

- What level of income will keep consumption expenditure at a certain level?

Methodology of Econometrics (Summary)

| Economic Theory | Mathematical Model of Theory | Econometric Model of Theory | Data | Estimation of Econometric Model | Hypothesis Testing | Forecasting/ Prediction | Control or Policy Purposes |

ECONOMETRICS

THANK YOU!

Next Lesson: The Nature of Regression Analysis