

What is this course all about?

Econometrics is the unification of economic theory and statistical methodology.

Broadly this involves three steps:

- Estimating economic relationships
 - Demand/supply for various products
 - Effect of different levels advertising on sales and profit
 - Impact of monetary and fiscal policies on employment, income, interest rates, inflation rates

- Confronting economic theory with facts and testing hypotheses involving economic behaviour. For instance, we can determine whether:
 - A new advertising campaign has been effective in increasing sales
 - Returns to scale increasing or decreasing
 - Demand for a given good is elastic or inelastic with respect to price

- Forecasting the behaviour of economic variables
 - Forecast sales, profits, cost of production and inventory requirements
 - Utilities project demand for energy
 - Forecast stock market indices and price of specific stocks

Usually we have to base these steps on **sample** data rather than the **population**. We will therefore have to deal with **uncertainty**:

- Estimated economic relationships will not be perfect
- Conclusions from hypothesis testing subject to error
- Forecasts are not right on target

What does an econometric model look like?

Example

A real estate agent wants to relate the sale price of a house to its living area in square feet. Assuming the relationship is linear, we have

$$PRICE = \beta_0 + \beta_1 SQFT.$$

Suppose we identify two houses with the same living area but their sale prices are not the same. Why would this happen?

Our relationship is not precise but subject to error. To allow for this **error**, we specify the **econometric model** as follows

$$PRICE = \beta_0 + \beta_1 SQFT + \varepsilon.$$

This model is known as a **linear regression model**.

Now what? Suppose we fix SQFT at certain levels and record the sales prices of **all the houses** in a given area that have SQFT at these levels.

Now, we calculate the average price at each of these SQFT levels. The assumption behind the model is that these averages lie on the straight line $\beta_0 + \beta_1 SQFT$.

This true average relationship is called the **population regression line**. In practice, we will draw a sample and estimate this relationship with a **sample regression line**.

In this course:

- We will learn how to estimate and test economic relationships
- We will use EViews to do so

Why?