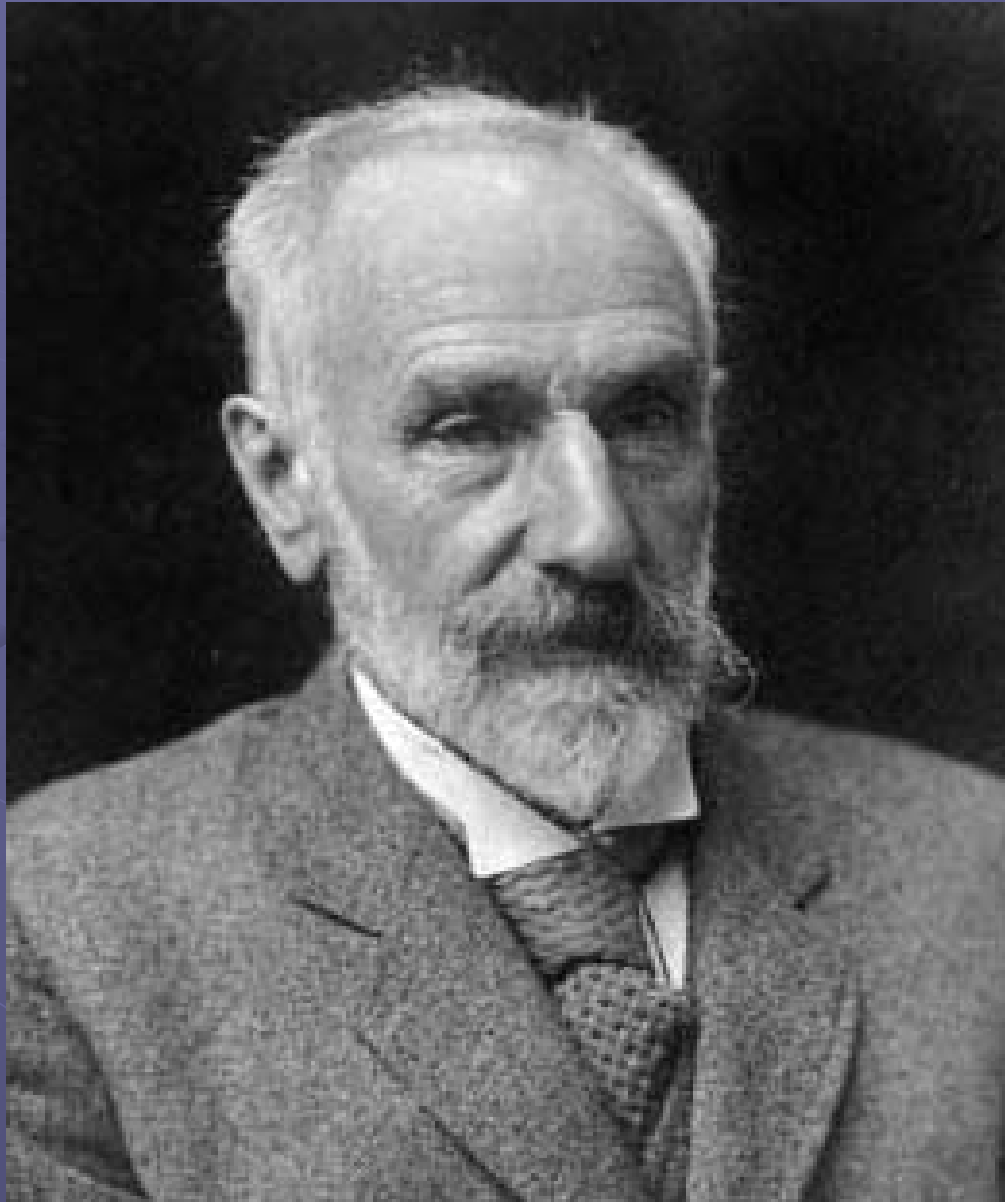


Francis Ysidro Edgeworth



Irish Economist & Statistician

1845 - 1926

Presented by Cheryl Chen

Background – Influenced by – Contributions – Impact - Critique

- ❖ Was born in Edgeworthstown, County Longford, Ireland.
- ❖ Died in Oxford, Oxfordshire, England.
- ❖ Studied ancient and modern languages at Trinity College, Dublin and Balliol College, Oxford.
- ❖ In 1862, he entered Trinity College, Dublin at the age of 17 and studied French, German, Spanish and Italian.
- ❖ Did not attend school, but was educated by private tutors in his home until he enter university.
- ❖ Was self-taught in mathematics and statistics but did not study those subjects until after he had completed university.

Background – Influenced by – Contributions – Impact - Critique

- ❖ In 1888, was also a barrister, and held the Tooke Chair of Economic Science at King's College.
- ❖ In 1891, he left London to take up the Drummond Chair of Political Economy at Oxford.
- ❖ In 1891-1926, was professor of political economy at Oxford and became the first editor of *Economic Journal* and was succeeded in this role by John Maynard Keynes.
- ❖ The Economic Journal is still the most important and the oldest journal of economics and remains one of the leading scholarly publications in economics today.

John Maynard Keynes

(1883 -1946)

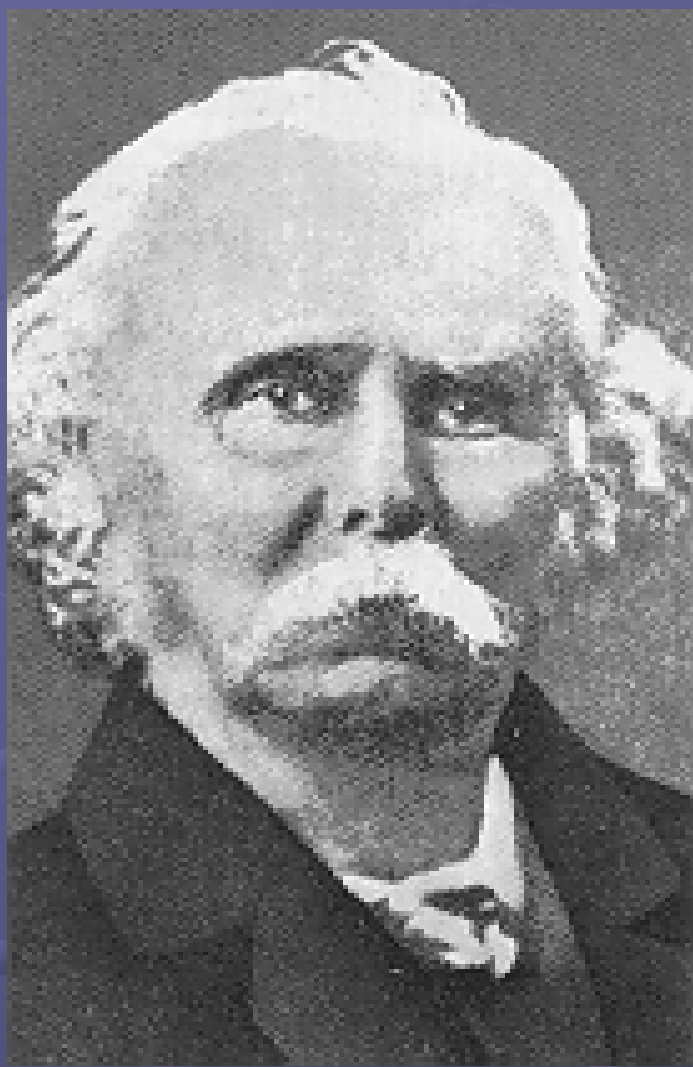


- ❖ was a British economist.
- ❖ Is one of the fathers of modern theoretical macroeconomics.
- ❖ Had a major impact on modern economic and political theory as well as on many governments fiscal policies.
- ❖ Famous book, ***The General Theory of Employment, Interest and Money***, which was originally published in 1936 in London by the St. Martin's.
- ❖ In 1926, Edgeworth was succeeded in Economic Journal by Keynes.

William Stanley Jevons (1835 – 1882)

- ❖ British economist and mathematician.
- ❖ Close friend and neighbor of Edgeworth.
- ❖ Was known of **Marginal Utility Theory**.
- ❖ The most important of his works on logic and scientific methods is his **Principles of Science** (1874), as well as **The Theory of Political Economy** (1871).





Alfred Marshall

(1842 – 1924)

- ❖ Was one of the most influential economists, and commented in his review of Edgeworth's *Mathematical Psychics*:

“ This book shows clear signs of genius, and is a promise of great things to come...His readers may sometimes wish that he had kept his work by him a little longer till he had worked it out a little more fully, and obtained that simplicity which comes only through long labour. But taking it as what it claims to be, ‘ a tentative study’, we can only admire its brilliancy, force, and originality.”



Martin J. Shubik

- ❖ was born on March 24, 1926.
- ❖ Specializes in strategic analysis, the study of financial institutions, and the economics of corporate competition, and is a well-known figure in **game-theory**.
- ❖ Edgeworth's "range of final settlements" was later resurrected by Martin Shubik (1959) as the game-theoretic concept of " the core".

Contributions

1. Mathematical Psychics
2. Methods of Statistics
3. Indifference curves
4. The Edgeworth box

Mathematical Psychics

- ❖ In 1881, he published *Mathematical Psychics: An Essay on the Application of Mathematics to the Moral Sciences*.
- ❖ In fact most of his work could be said to be applications of Mathematical Psychics.
- ❖ Was applied to the measure of **Utility**, the measure of **ethical value**, the measure of **evidence**, the measure of **probability**, the measure of **economic value**, and the determination of **economic equilibria**.

Mathematical Psychics

- ❖ Was notoriously difficult to read.
- ❖ Because he referenced literary sources and interspersed the writing with passages in a number of languages, including Latin, French and Ancient Greek.
- ❖ In addition, mathematics wasn't easy either, and a number of his creative applications of mathematics to economic or moral issues would be judged as incomprehensible.

Methods of Statistics

- ❖ In 1880, he made significant contributions to the methods of statistics.
- ❖ In 1892, Edgeworth examined correlation and methods of estimating correlation coefficients in a series of papers. (Correlation - indicates the strength and direction of a linear relationship between two random variables).
- ❖ Example: do you expect the correlation between class size and grades to be positive or **negative**?

Find out more at:

[http://www.history.mcs.standrews.ac.uk/history/
Mathematicians/Edgeworth.html](http://www.history.mcs.standrews.ac.uk/history/Mathematicians/Edgeworth.html)

Methods of Statistics

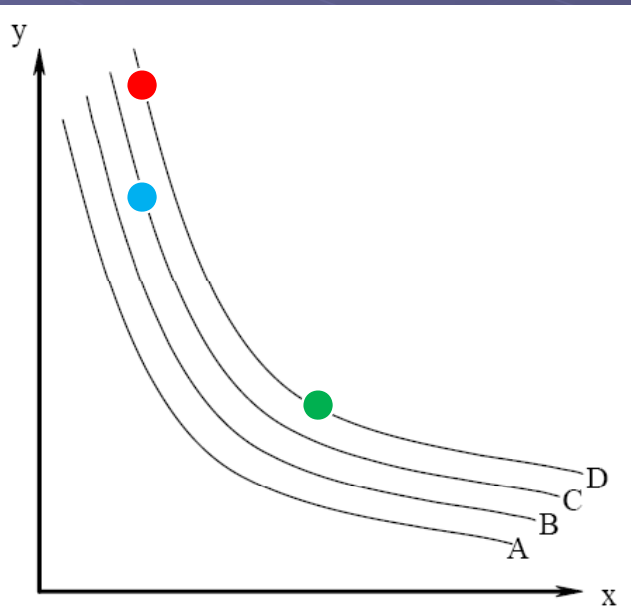
- ❖ In 1877, his first book, *New and Old Methods of Ethic* was published.
- ❖ In 1885, he also published *Methods of Statistics* which presented an exposition of the application and interpretation of significance tests for the comparison of means. (Remember ECON 311, ECON 312?)
- ❖ Edgeworth's contributions to Economics continue to influence modern game theorists.

Indifference curves

- ❖ **Mathematical Psychics** was the first to introduce the concept of indifference.
- ❖ Edgeworth introduced it into economics the generalized utility function and drew the first “**Indifference curve.**”
- ❖ An indifference curve in microeconomic theory is a graph showing different bundles of goods, between which a consumer is indifferent. At each point on the curve, the consumer has no preference for one bundle over another, they are all equally preferred. One can equivalently refer to each point on the indifference curve as rendering the same level of utility for the consumer.

Indifference map

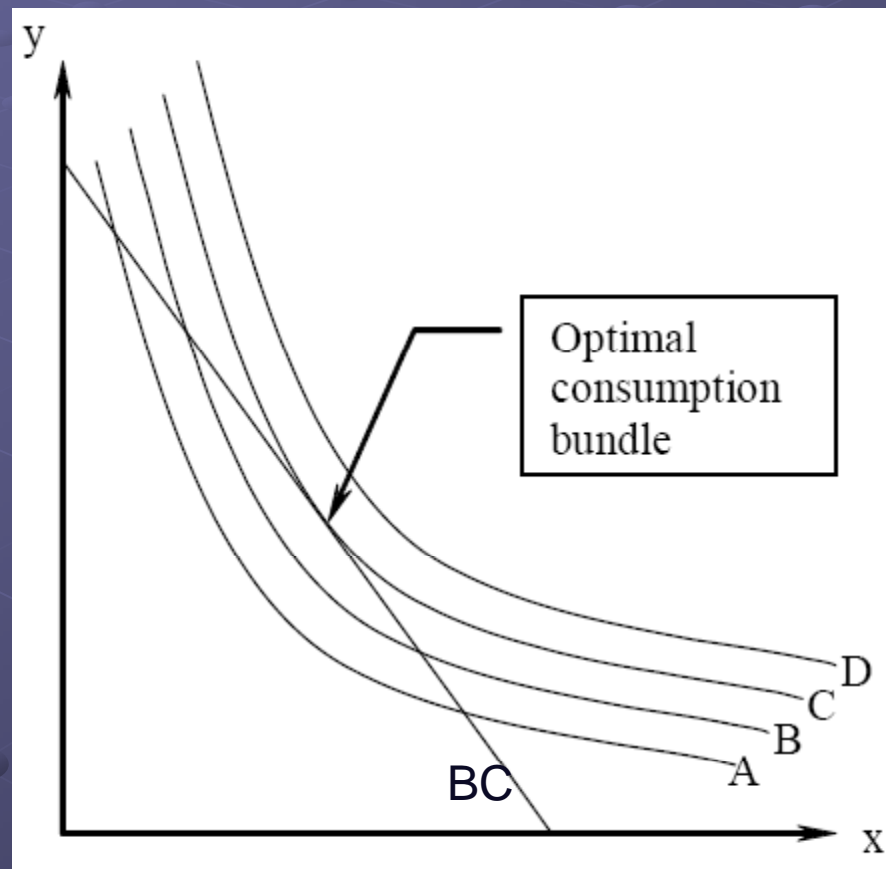
❖ Indifference map is a graph of indifference curves for an individual consumer associated with different utility levels.



Properties of indifference curves:

1. Defined only in the positive (+,+) quadrant of commodity-bundle quantities.
2. Has negative slope. That is, as quantity consumed of one good (X) increases, total satisfaction would increase if not offset by a decrease in the quantity consumed of the other good (Y).
3. Higher indifference curves represent better bundles, if we assume that more consumption of X and Y is better.
4. Two indifference curves can not intersect because all points on an indifference curve are ranked equally preferred and ranked either more or less preferred than every other point not on the curve.

Optimal Choice

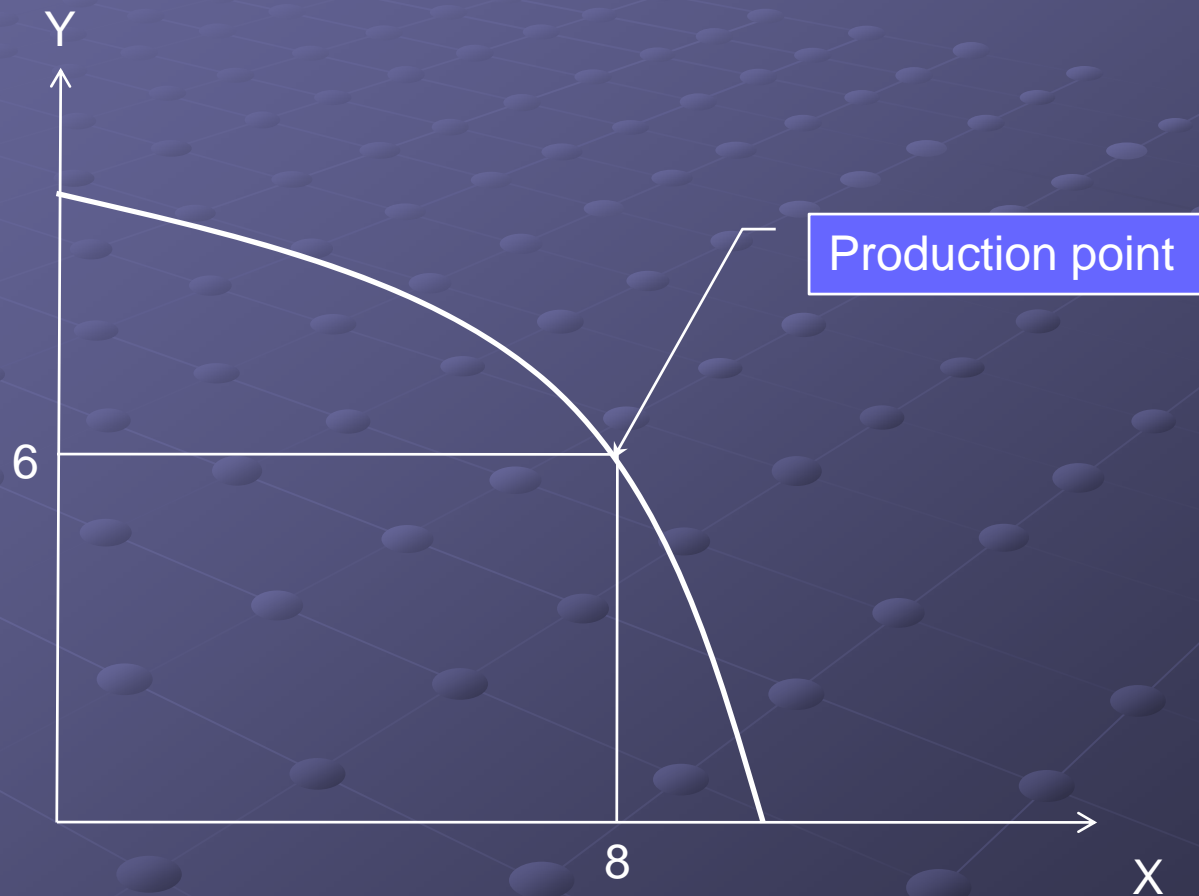


The Edgeworth Box

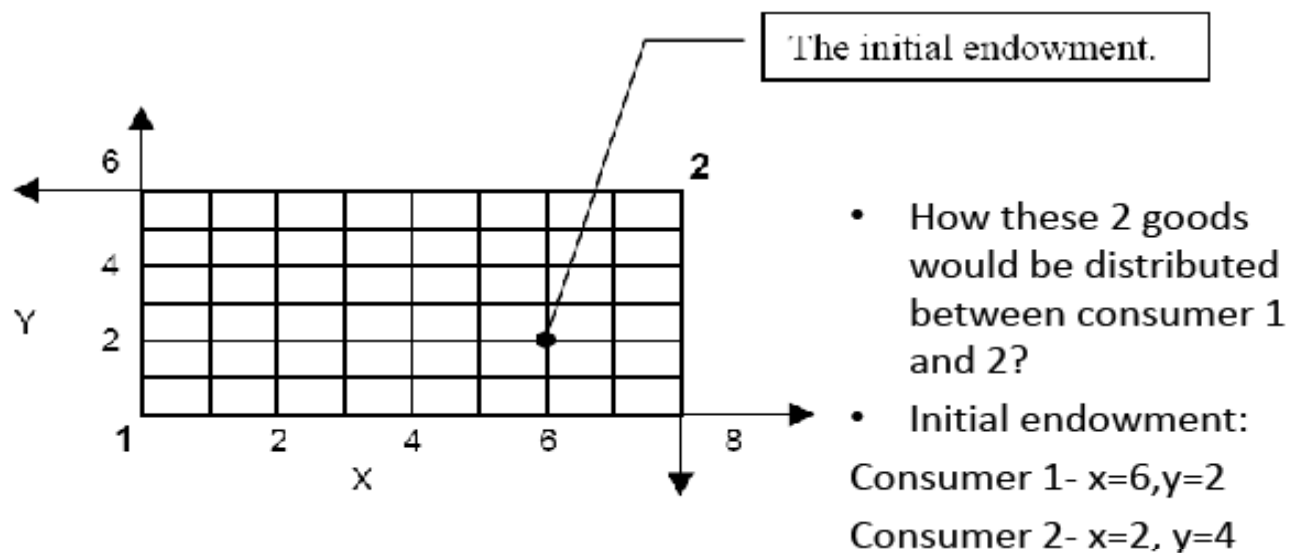
- ❖ Developed this method of analysis in the last portion of the 19th century.
- ❖ Was first shown in his work *Mathematical Psychics*.
- ❖ Shows all the possible ways of allocating two goods, in fixed amount, between two agents.
- ❖ Was one of his most important contributions.

Background – Influenced by – **Contributions** – Impact - Critique

Remember Production Possibilities Frontier?

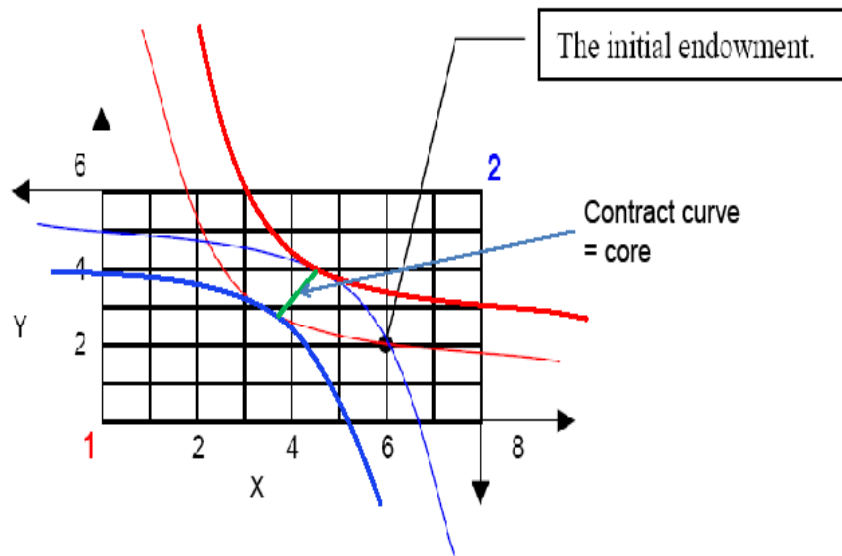


2-Edgeworth box (a graphical tool for describing feasible allocations in an economy with 2 agents and 2 goods)



Francis Ysidro Edgeworth (1845-1926).

2-Edgeworth Conjecture



Francis Ysidro Edgeworth (1845-1926).

- ❖ Red curve : consumer 1
- ❖ Blue curve : consumer 2

Impact

- ❖ living from 1845 to 1926, Edgeworth's notion of competitive equilibrium in barter economies continues to influence modern game theorists. He noted that the resulting game permitted many solutions but the number of solutions is reduced as the size of the economy grows.

The Edgeworth box is used frequently in general equilibrium theory, and can help in finding the competitive equilibrium of a simple system.

Critique

- ❖ was a very skilled mathematician and statistician.
- ❖ However, his Mathematical Psychics book which was originality demonstrated in his most important book on economics was very difficult to read.
- ❖ He frequently referenced literary sources and interspersed the writing passages in a number of languages, including Latin, French and ancient Greek.
- ❖ William Stanley Jevons said of Mathematical Psychics:
“ Whatever else readers of this book may think about it, they would probably all agree that it is a very remarkable one... There can be no doubt that in the style of his composition Mr. Edgeworth does not do justice to his matter. His style, if not obscure, is implicit, so that the reader is left to puzzle out every important sentence like an enigma.”

Questions

1. Draw an Edgeworth box for a one-good economy.



2. Why two indifference curves can not intersect each other?

because all points on an indifference curve are ranked equally preferred and ranked either more or less preferred than every other point not on the curve.