Economics, a Comprehensive Guide

Jethro Kuan, Vishnu R. Menon

July 16, 2013

Contents

Chapter 1

Preface

Preface

Chapter 2

Part 1: Microeconomics

Scarcity, Opportunity Cost and Economic Efficiencies

Scarcity

Scarcity means that society has **limited resources** and **unlimited wants**. Economics, in turn, is the study of choices individuals make and its consequences.

Our society faces the scarcity of four resources:

1. **Labour**: time humans spend in producing goods and services
2. **Capital**

   a. **Physical**: physical goods; machinery, equipment etc.
   b. **Human**: skills/knowledge of the labour force

3. **Land**: physical space on which production takes place
4. **Entrepeneurship**: ability and willingness to combine the above 3 resources

Opportunity Cost

Opportunity cost is defined as the following:

> **Opportunity cost** is the cost of an alternative that must be forgone in order to pursue a certain action.

Such costs come in different forms, but under either **explicit costs** or **implicit costs**. Explicit costs refer to the *dollars sacrificed*, while implicit costs refer to the *value of something sacrificed when no direct payment is made*.

All production carries with it an opportunity cost, because resources are allocated into producing a good, which could be allocated to the production of other goods.

The Law of Opportunity Cost

> **The Law of Opportunity Cost** states that the more of something we produce, the greater the opportunity cost of producing it.

This results in the concave shape of the PPC curves.

Opportunity costs are however not easily calculated, for it **requires time and information**. Opportunity cost also **varies with circumstance**, and a context is required for such calculations. This can lead to implicit costs varying widely in different circumstances.

Rational Choices

Choices involve the weighing of the benefits of any activity against its opportunity cost. That is consumers, consuming a particular amount of a good by considering the marginal costs and marginal benefits of the good. You will get more familiar with this concept in market failure.

Efficiency, and the PPC

PPC stands for Production Possibilities Curve. It is a curve showing all combinations of 2 goods (Axis labelled "Good A" and "Good B") that can be produced with the resources and technology currently available.
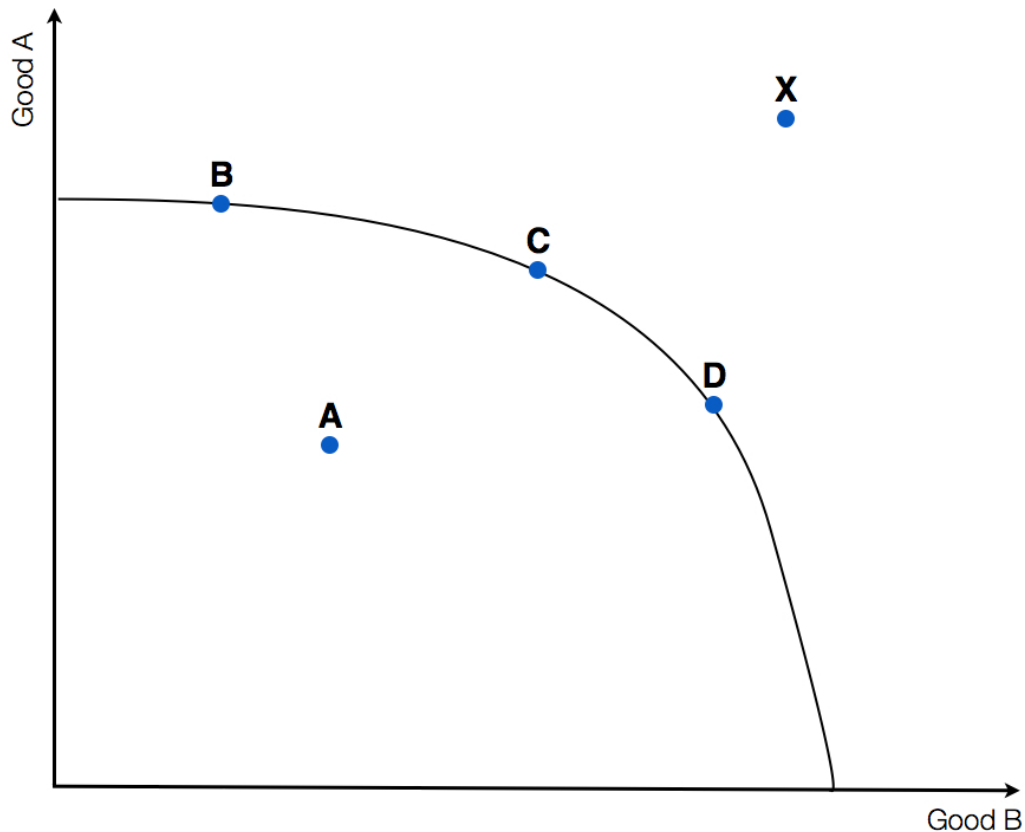

Figure 2.1: PPC

Any point on the curve (Points B,C and D) indicate that the economy has achieved **productive efficiency**. Point A lies inside the curve, so if the economy operates at point A, the economy is **productive inefficient**. Point X lies outside the curve, and this point is unattainable with the economy's current amount of resources and technology. Over time, the production possibilities of a nation are likely to increase. Investment in new plant and machinery will increase the stock of capital; new raw materials may be discovered; technological advances are likely to take place; through education and training, labour is likely to become more productive. This growth in potential output is illustrated by an outward shift in the production possibility curve. This will then allow actual output to increase.

The microeconomic goal of an economy is to achieve efficiency, but only productive efficiency can be illustrated with the PPC curve. Whether allocative efficiency has been achieved (where on the PPC the point lies) can only be determined through other means. Other efficiencies that the economy is concerned about include dynamic efficiency and X-efficiency, but these will be discussed in greater detail later on.

Demand and Supply

I assume you've read this topic before, so my focus here is clarifying doubts and making concepts clear rather than going through them from start to end. One might notice that for oligopolies, there is no such thing as a "market price". How do we then do demand and supply analyses for markets like oligopolies and monopolies when there aren't the corresponding supply curve?

The simple answer is, **you can't**.

The markets examined with the demand and supply model are assumed to be perfectly competitive. But don't go telling cambridge examiners when they ask questions that their question is invalid; just follow the requirements of the question. This scenario only happens when the examiners are trying to test both market structure and demand and supply at once, so forgive them.

Demand

Law of Demand

> The law of demand states that when the price of a good rises, the quantity demanded will fall. This results in the *downward sloping* demand curve.

There are two effects that account for the law of demand.

1. **Income Effect**: People will feel poorer as the purchasing power of their real income has dropped, resulting in decreased consumption
2. **Subsitution Effect**: Other goods will now appear relatively cheaper, and people will switch over to these alternatives

Determinants of Demand

Resource Allocation in Competitive Markets

Firms and How They Operate

Market Failure

What is Market Failure?

Market Failure is defined as the following:

> Market Failure is the failure of the **free market** to allocate resources in a fashion that **maximises societal welfare**.

This is the justification for government intervention. The very fact that the free market is failing to maximise societal welfare means that the government has to step in and take measures, which will be explored later, to correct the market failure.

Causes of Market Failure

Market failure occurs because of various reasons, all of which fall under these broad-based categories:

1. Public Goods
2. Positive and Negative Externalities
3. Merit and Demerit Goods
4. Imperfect Information
5. Immobility of Factors
6. Inequity of income and wealth
7. Market Dominance

Note: "Inequality" is a mathematical concept ($\geq$ and what not), while "inequity" is the social/moral concept, and the latter is what economics in this context wants

Public Goods

There are two defining characteristics of a public good: **non-rivalrous** and **non-excludable**.

Non-rivalrous   A good is non-rivalrous when *an individual consumer does not reduce the quantity of the good available to other consumers.* That is, the marginal cost of providing the good to one more consumer is 0. In mathematical terms $MC = 0$.

> Make a mental note that this MC is not the marginal cost of *producing* the good, but the marginal cost of *consuming* the good.

Examples of non-rivalrous goods are: radio signals, light from street lamps etc.

Non-excludable   Non-excludable goods are either *impossible* or *prohibitively costly* to exlucde non-payers from consuming the good. That is, the goods are excludable *NOT by choice*. For example, a library can easily be made excludable by prohibiting people from entering, so a library is not a public good.

How Public Goods Lead to Market Failure The combination of non-rivalry and non-excludability leads to what is famously known as the **free rider problem**. Since it is impossible to exclude someone from consuming a good, rational consumers will choose to free ride from someone who possesses the good. Because the good is not "used up" upon free-riding, the ability to free ride the good can persist in the long run.

This results in all consumers unwilling to pay for the good. i.e.

$$P = MC = 0$$

Prices can be seen as the value the consumer places on the good in question, but the price signal sent by consumers would then be zero in the case of public goods. The price signal does not reflect the value the consumers place on the good (which is a positive price), and this incorrect signal results in the failure of the price mechanism.

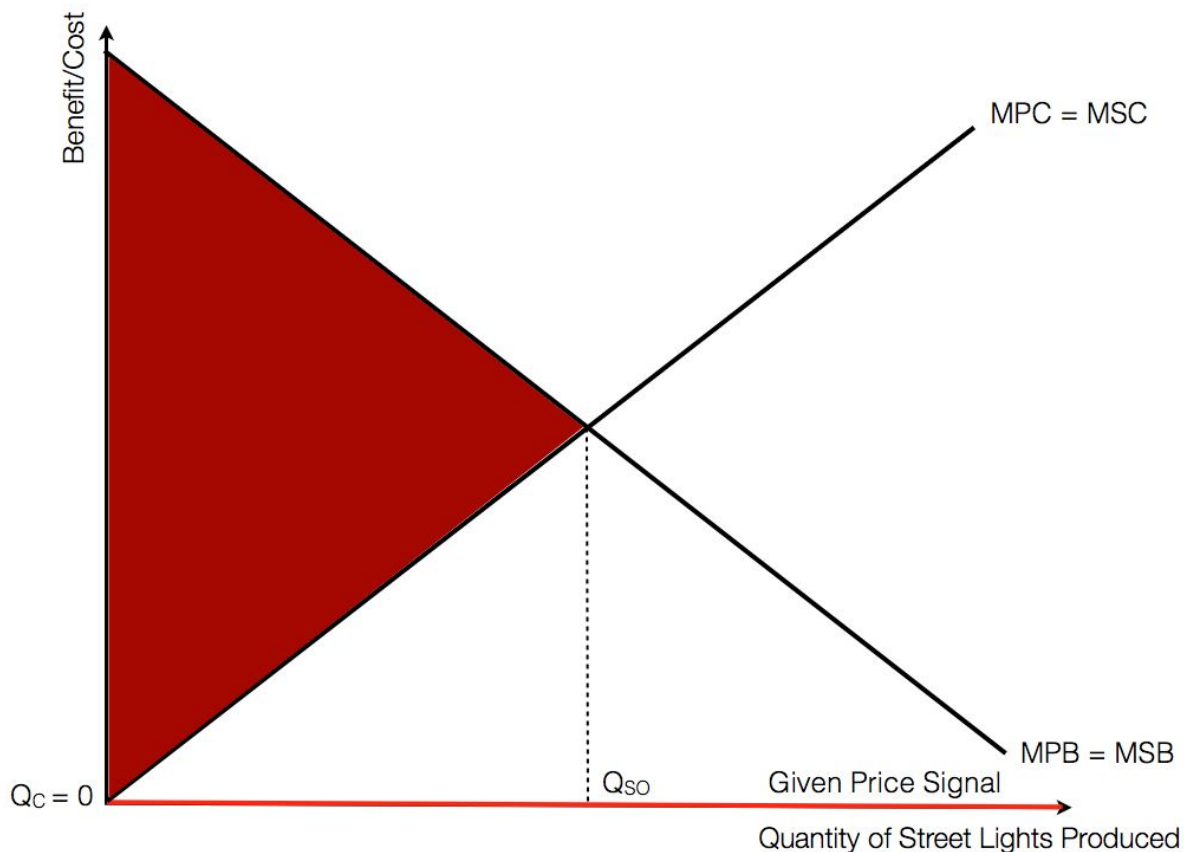This is illustrated in the graph below:

Figure 2.2: Public Goods

The price signal transmitted is the orange line, while the actual value the consumers place on the good is given by the MSB/MPB curve. Assuming no externalities, social optimum quantity is where the MSC and MSB curves intersect. As we can see the quantity consumed is now 0, an underconsumption. For each additional unit from 0 till Q_{SO}, the marginal benefits of consuming the good outweigh the marginal costs. There is thus a deadweight-loss due to underconsumption, given by the red shaded area.

Policies

Direct Provision By having the government the government produce public goods, the decision to produce and consume the goods are now in the hands of the government. The production of public goods will be in the amount which the government *perceives* to be social optimal quantity, financed by taxpayers money.

Limitations

Direct provision might lead to the production of a good which should never have been produced in the first place. Less drastically, it is difficult for the government to determine the social optimum quantity for production, and it produces the public good at the level it deems to be social optimal. This could result in over/under-production of the good, that might even result in a greater deadweight-loss. This is an example of government failure.

Positive and Negative Externalities

Merit and Demerit Goods

Imperfect Information

Immobility of Factors

Inequity of Income and Wealth

Market Dominance

Chapter 3

Part 2: Macroeconomics

Key Economic Indicators

Just as how doctors require tools like thermometers to give a quantitative measure of the health of an individual, economic indicators are required to describe and assess the macroeconomy. These economic indicators are used to measure *relative* economic performance between countries(**international comparison**), or comparing the economic performance of a single country as time progresses (**intertemporal comparison**).

Size of the Economy

Economists use the concept of **national income** to measure the size of the economy. National income is proportional to the amount of economy activity within the country, and therefore ceteris paribus, the greater the national income, the greater the level of economic activity.

Gross Domestic Product (GDP)

Nominal GDP is the sum of the market value of all *final* goods and services produced *within a country* over a given period of time (usually a year)

$$GDP = \sum P_x \times Q_x$$

The goods and services here are final goods and services, because the inclusion of semi-finished goods would result in a miscalculation, specifically **double counting**, where the market value of semi-finished goods are included along with the market value of the its final form.

As the term "domestic" implies, this number will only include economic activity (production) within the country. Whether the goods produced within the country are consumed by local or foreign households however does not matter.

Real GDP

However, a nominal GDP increase does not necessarily indicate a healthy economy. Notice there are two terms in the formulation of GDP, P_x and Q_x. This would mean that a GDP increase could be solely due to an increase in general price levels, and not output levels.

To better determine if economic growth was a result of increase in output levels, economists use the concept of **real GDP**. This is achieved by multiplying the value of output each year with the prices of those goods *in some predetermined year*. This year is known as the **base year**, and the price prevailing at that period of time is the **base year price** of the good.

$$\text{Real GDP} = \sum P_{byp} \times Q_x$$

Gross National Product (GNP)

While GDP measure the market value of final goods and services *produced within the country*, the GNP measures the market value of final goods and services *produced by citizens of the country*, **regardless of where they reside**.

$$\text{GNP} = \text{GDP} - \text{net factor (property) income from abroad}$$

The concept of GNP is important when many of the citizens of a country reside overseas, of which the income they generate overseas are repatriated to back to their home country. The value of the GDP will then be vastly different from that of the value of the GNP.

Net National Product (NNP)

The NNP is used by economists to recognise that some of the capital stock used suffer from wear and tear and require replacement. Capital stocks include items such as machinery and equipment. This would mean that the NNP would provide a better indication of the increase in productive capacity.

$$\text{NNP} = \text{GNP} - \text{Depreciation}$$

Depreciation is also sometimes termed as **capital consumption** and **replacement investment**.

Making Comparisons

Intertemporal Comparisons

Measuring Economic Growth To measure economic growth (this phrase is already a first derivative; "change in economic activity over time"), economists calculate the *percentage change* of GDP:

$$\%\Delta\text{GDP}_x = \left(\frac{\text{GDP}_x - \text{GDP}_{x-1}}{\text{GDP}_{x-1}}\right) \times 100\%$$

Accounting for Population Changes

While GDP is an indication of the total economic activity of the country, it is not indicative of the amount of income received per person in the population on average. This information is important as it gives economists an idea of how much "richer" each individual on average is. To account for the population changes, economists use the concept of **GDP per capita**.

Mathematically we write:

$$\text{GDP per capita} = \frac{\text{GDP}}{\text{population}}$$

We can approximate changes in per capita GDP by differentiating both sides by time.

$$\frac{d\text{GDP per capita}}{dt} \approx \frac{\frac{d\text{GDP}}{dt} \times \text{population} - \text{GDP} \times \frac{d\text{population}}{dt}}{\text{population}^2}$$

$$\frac{\frac{d\text{GDP per capita}}{dt}}{\text{GDP per capita}} \times 100\% \approx \frac{\frac{d\text{GDP}}{dt} \times \text{population} - \text{GDP} \times \frac{d\text{population}}{dt}}{\text{population}^2 \times \frac{\text{GDP}}{\text{population}}} \times 100\%$$

Rearranging the terms, we get:

$$\%\Delta\text{GDP per capita} \approx \%\Delta\text{GDP} - \%\Delta\text{population}$$

")

Macroeconomy and How It Works

International Economics