Consumer Sovereignty

Andrew Trigg

Concepts and techniques
- Consistent preferences
- Indifference curves
- Ordinal preferences; utility maximization
- Marginal rate of substitution
- Diminishing marginal rate of substitution; convexity

Feasible consumption set; budget constraint
- Slope of a line; slope of a curve; tangency
- Income and substitution effects
- Normal, inferior and Giffen goods
- Lexicographic preferences
- Slutsky approximation
- Revealed preference

Links
- This chapter shows how two of the core assumptions of neoclassical economics, methodological individualism and rationality, explored in Chapter 1, form the basis of the neoclassical theory of consumption.
- The consumer demand curve forms one of the essential building blocks of the general equilibrium model. It was introduced in Chapter 1 and will be explored further in Chapter 18.
- Similar techniques of maximization under constraints will be used in Chapter 5 to derive a household’s labour supply curve, and in Chapter 10 to consider how firms choose between competing techniques of production.
- Alternative theories of consumption will be explored in Chapter 3.
- In Chapter 4, demand curves and the Slutsky approximation are used to derive price indices and provide one measure of household welfare.
Introduction

‘The free enterprise economy is the true counterpart of democracy: it is the only system which gives everyone a say. Everyone who goes into a shop and chooses one article instead of another is casting a vote in the economic ballot box: with thousands or millions of others that choice is signalled to production and investment and helps to mould the world just a tiny fraction nearer to people’s desire. In this great and continuous general election of the free economy nobody, not even the poorest, is disfranchized: we are all voting all the time. Socialism is designed on the opposite pattern: it is designed to prevent people getting their own way, otherwise there would be no point in it.’

(Powell, 1969, p.33)

In this quotation from the late Enoch Powell’s book Freedom and Reality, the once prominent UK politician conveys the idea of consumer sovereignty – the idea that in a free market economy, individual consumers choose which goods are produced. Instead of a king, dictator or central planner making decisions, sovereignty is vested in the everyday choices of individual consumers. These individual choices lead by an ‘invisible hand’ to the best possible outcome for the economy as a whole.

Consumer sovereignty

Consumer sovereignty holds when consumers have the power to dictate what is produced in the economy.

This view of the free market became increasingly dominant with the emergence of Thatcherite and Reaganite policies in the early 1980s, and the collapse of the eastern European bloc of centrally planned economies in the late 1980s. Indeed, it has been argued that the inability of the Soviet system to satisfy consumer demand was one of the main reasons for its demise. John Kenneth Galbraith, for example, has pronounced that the Soviet system:

‘... could not satisfy the infinitely diverse and unstable demand for the services and products that make up the modern consumers’ goods economy. Here socialism, both in planning and administration, proved far too inflexible. One may marvel at the attraction of often frivolous and dispensable consumer artifacts and entertainments in our time, but their ultimately controlling appeal cannot be doubted.’

(Galbraith, 1992, p.7–8)

An enduring image of the collapse of communism in eastern Europe was that of East Germans queuing to cross into the west in their patched-together Trabants. These 1950s style vehicles revealed how starved the East Germans had been of western consumption goods during the years of state planning. More than anything, the car has provided the symbol of the triumph of consumerism. For those on the right of the political spectrum, ‘... the motor car epitomizes the freedom of private consumers to go where they please, without relying on government, business or anyone else to run the buses, coaches or railways on time’ (Gabriel and Lang, 1995, p.16). In this view, the triumph of western capitalism can be attributed more to Mercedes Benz and BMW than to Cruise and Trident missiles.

Mirroring this dominance of capitalism in the world economy, the world’s economics profession has been dominated by neoclassical economics (Chapter 1 outlined the framework of neoclassical economics and some alternative approaches). Although neoclassical economists vary in their individual political allegiances, their approach has been used to provide a technical demonstration of why free market capitalism offers the best system for organizing an economy. In neoclassical economics, the choices of the individual consumer are shown to determine what is produced: this is what is meant by consumer sovereignty. A defining assumption of neoclassical economics is that all individuals follow their own self-interest, whether as producers deciding which is the most profitable method of production, or as consumers choosing which goods to purchase. To make profits, producers must sell their wares. To do so, they must produce what consumers want. The neoclassical approach shows how consumer sovereignty is achieved by a market economy in which both producers and consumers act according to their self-interest.
This chapter focuses on the individual consumer whose behaviour provides the key building block for the neoclassical theory of consumption. In this theory, the individual’s preferences provide the basis for choosing between different goods and services. I may, for example, according to my own particular tastes, prefer to buy a Top 10 CD than a record by Showaddywaddy. It follows, since others obviously feel the same way, that we will be prepared to pay the full price for a Top 10 CD in a Virgin Megastore, but we will only buy Showaddywaddy records when they are discounted for 99p in Woolworths. The point here is that my preferences drive my demand and hence provide the signal in the marketplace as to what prices can be charged. This relationship between preferences, demand and price provides the focus of Section 2 of this chapter which demonstrates how the tastes and preferences of individual consumers are communicated in the marketplace.

The rest of the chapter critically discusses the neoclassical theory of consumer behaviour. Of particular interest is the way in which consumers respond to changes in price. Say the price of bread falls sharply in your supermarket. This can have two effects. It may encourage you to buy more bread instead of, say, potatoes; and it will also mean that you are better off in real terms and can, therefore, afford to buy more bread and more potatoes. Section 3 provides an initial analysis of these two impacts of a price change, using the neoclassical theory of consumer behaviour.

In Section 4 I look at this theory’s core assumption that consumers act according to their own preferences, like rational calculating machines, and that this gives them a full say in the ballot box of consumer democracy. I shall consider the implications of consumers either being too poor to exercise much choice in this ballot or being irrational in their behaviour.

As part of this discussion, a test of the model is provided by introducing an example from experimental economics. The problem with economics, in comparison with many physical sciences, is that it is very difficult to carry out controlled experiments. A chemist can control the amount of chemicals in his measuring jar and test whether or not they will generate an explosion. Experimental economics tries to carry out its own tests by setting up artificial environments in which economic behaviour can be observed.

2 The neoclassical theory of consumption

A schoolboy calling at the corner shop on the way home from school has to decide how to allocate his pocket money on crisps and chocolate; a young executive decides how to spend her month’s salary on clothes and jewellery; and Lennox Lewis, surviving yet another challenge to his world heavyweight boxing title, decides whether to spend his earnings on a helicopter or a yacht.

Neoclassical consumer theory is based on the assumption that, in making a comparison between different items of consumption, individuals have preferences which they use to rank the possible alternatives. Assume, for example, that the schoolboy has to choose between two possible combinations of crisps and chocolate. In one shopping basket there are three packets of crisps and three bars of chocolate – this can be referred to as bundle A. In the other shopping basket there are two packets of crisps and two bars of chocolate – this can be referred to as bundle B.

In choosing between these two bundles, the individual, in this case the schoolboy, must decide ‘Do I prefer bundle A to bundle B?’ We use the symbol > to indicate the direction of preference:

A > B; read this as A is preferred to B.
Since the schoolboy likes both crisps and chocolate, he will prefer bundle A to bundle B, and it follows that he ranks bundle A more highly than bundle B. The bundles are arranged in a particular order, in which A is ranked higher than bundle B. Notice that we are not assuming that the individual places any particular absolute value on either basket, merely that one is valued more, or ranked higher, than the other. Since preferences produce a ranked ordering in this way, they can be said to be ordinal.

### Ordinal

An individual's preferences are ordinal if they allow different baskets of goods to be ranked in order of preference.

The assumption that individuals use preferences to rank alternatives provides the starting point for the neoclassical theory of consumption.

In addition to assuming that consumers rank alternatives, neoclassical economics also assumes that their rankings are consistent. Consumers must be consistent in their choices: if an individual prefers bundle A to bundle B, he or she cannot also prefer B to A. Consumers must behave like rational individuals who carefully calculate choices and then stick to these choices. Switching from one choice to another would be behaving inconsistently and this would be considered irrational by the neoclassical economist.

The assumption of consistency can be represented formally by the statement:

\[
\text{If } A > B, \text{ then } B \not> A
\]

### Consistency

If a consumer prefers A to B then for consistency to hold he or she must never prefer B to A.

Many of the important predictions and policy implications of the neoclassical approach depend on the consistency assumption. Some of these predictions and the evidence for and against them will be dealt with specifically in this chapter, while Chapter 4 will look at the way in which consumer theory is used for measuring the welfare of individuals. For welfare purposes, when someone prefers A to B, the neoclassical assumption is that we can infer that they are better off with A rather than B, so that a policy which results in that person consuming A is better than a policy that results in them consuming B. If, however, the individual's choices were inconsistent then they would not provide a basis for assessing welfare and making policy choices. It would be impossible to judge whether consuming A or B is the better outcome. As well as examining the theoretical implications of the consistency assumption, the discussion that follows will also examine some empirical evidence as to the viability of that assumption.

### 2.1 The indifference map

To examine a consumer’s preferences between two goods, \(F\) and \(G\), a diagram can be drawn in which quantities of good \(F\) are measured on the vertical axis and quantities of good \(G\) on the horizontal axis. To continue with our schoolboy who likes chocolate (good \(F\)) and crisps (good \(G\)), assume that he has to choose between bundle A, which contains three of each good, and bundle B which contains two of each good. These bundles are represented by points A and B on Figure 2.1.

Now there is, of course, a reasonable explanation why bundle A will always be preferred to bundle B. If we assume that consumers always prefer more to less then bundle A will be preferred to bundle B and the schoolboy will always prefer a bundle containing more bags of crisps and more bars of chocolate.

Bundle A is, in fact, preferred to all the bundles in the bottom left shaded quadrant of Figure 2.1. Each bundle inside this shaded area contains less of both good \(F\) and good \(G\) than bundle A. On the top boundary of the shaded area are bundles containing the same amount of chocolate but less crisps than bundle A. On the right boundary are the bundles containing the same amount of crisps but less chocolate than bundle A. All of these are less preferred than A by the schoolboy.

Bundle C in Figure 2.1, however, represents a combination of good \(F\) and good \(G\) which the consumer will prefer to the bundle at point A. It contains four bags of crisps and four bars of chocolate, compared to only three of each good at point A. If, as before, the consumer prefers more to less, all the bundles in the top right shaded quadrant will be preferred to point A. In this model, it is assumed that the consumer is never completely
satisfied, always preferring more to less. However much he or she consumes, the consumer has never had enough of either good. This is the assumption of non-satiation.

This leaves the top left and bottom right quadrants of Figure 2.1. The important point to note about these unshaded areas is that they contain bundles of crisps and chocolate which are not necessarily regarded more highly or less highly than bundle A. There could, in fact, be some bundles which the consumer ranks equally to bundle A. The consumer is indifferent between these bundles, not preferring one particular combination of good F and good G to the others.

Assume that in Figure 2.1 our schoolboy is indifferent between the bundles at A and D. He is equally satisfied with a bundle which contains four bars of chocolate and two bags of crisps (bundle D) and a bundle which contains three bags of crisps and three bars of chocolate (bundle A). Assume further that crisps and chocolate can be divided into infinitesimal amounts. This allows us to join up all the bundles between which the individual is indifferent by a line which we call an indifference curve. All the bundles of goods represented by the points on an indifference curve are ranked equally by the consumer.

**Indifference curve**

An indifference curve represents all bundles of commodities which are ranked equally by the consumer.

Before looking at how such an indifference curve is used, we need to spend some time examining the assumptions underlying its shape. The magnitude of the slope of an indifference curve measures the rate at which a consumer is willing to give up one good in order to consume more of another. This rate is known as the consumer’s marginal rate of substitution (MRS).

**Marginal rate of substitution (MRS)**

The marginal rate of substitution (MRS) of good G for good F is the amount of good F the consumer is willing to give up for one additional unit of G, thus remaining on the same indifference curve.
Consider an indifference curve of an individual choosing between crisps (good $F$) and chocolate (good $G$) in Figure 2.2. At each point on the indifference curve, the marginal rate of substitution of good $G$ for good $F$, $\text{MRS}_{G,F}$, is the amount of good $F$ the consumer must give up to remain on the same indifference curve when he or she gets one more unit of good $G$.

A key assumption in drawing an indifference curve is that its marginal rate of substitution diminishes. The economic reasoning behind this assumption can be explained by first examining the movement from A to B in Figure 2.2. Here the schoolboy willingly gives up two bars of chocolate in return for one additional bag of crisps. This substitution leaves the schoolboy indifferent between the new bundle B and the original bundle A. Consider what he does, however, when moving from C to D. Here he is only willing to give up one bar of chocolate in return for one bag of crisps. Between C and D he is less willing to give up chocolate for crisps than between A and B. As the schoolboy moves along the indifference curve, crisps become progressively less attractive in comparison to chocolate which becomes progressively more attractive. The individual is assumed to have a diminishing marginal rate of substitution - the rate at which chocolate is willingly given up for crisps diminishes.

This means that, in the neoclassical theory of consumer behaviour, each individual is assumed to rank bundles of goods in a particular way. As the individual consumes more of good $G$ he or she is assumed to find good $F$ relatively more attractive. For an individual giving up good $F$ and consuming more of good $G$ there is a diminishing marginal rate of substitution.

Indifference curves with diminishing marginal rates of substitution all have a similar shape to the one drawn in Figure 2.2, that is, they all bow in towards the origin. The indifference curve has a slope which gets flatter as more of good $G$ and less of good $F$ is consumed. This gives the indifference curve that bowed shape. Such a shape is known mathematically as convex to the origin. Indifference curves with diminishing marginal rates of substitution are convex to the origin.
The indifference map in Figure 2.3 shows a number of indifference curves, each of which represents bundles between which the individual is indifferent. Of the three curves in Figure 2.3, the schoolboy will most prefer bundles on indifference curve 3. These bundles include larger amounts of crisps and chocolate than those on indifference curve 2. The least preferred options lie on indifference curve 1.

The traditional way of looking at these comparisons was to say that the individual is maximizing ‘utility’. Early neoclassical economists, such as Alfred Marshall (1842–1924), assumed that each individual calculates the amount of pleasure derived from consumption. A bundle anywhere on indifference curve 3, bundle A for example, could yield say five units of utility, and a bundle anywhere on indifference curve 2, such as bundle B, only three units. If the consumer maximizes utility, then it follows that bundle A is preferred to bundle B. The problem with this approach, however, is that utility is impossible to measure. To avoid this problem, modern neoclassical economists have developed the ordinal approach which requires merely the assumption that consumers rank bundles A and B in order of preference.

Once we recognize that it is the ranking of preferences that is fundamental to neoclassical economics, we can keep the notion of utility but use it simply as a way of looking at preferences. We can say that an individual obtains a higher level of utility by choosing bundle A instead of bundle B, but all this means is that the consumer prefers A to B without giving any meaning to the amounts of utility associated with each bundle. Throughout this chapter, therefore, I will use the shorthand description of maximizing utility to refer to actions which best satisfy the consumer’s preferences.

In terms of the indifference map, the consumer will always maximize utility by trying to get on the highest feasible indifference curve, the indifference curve that is furthest away from the origin. Increasing utility is represented by the broadening smile in Figure 2.3 as the individual moves on to the indifference curves further from the origin. Each trip to the supermarket, each flick through the pages of the Argos catalogue, is geared towards the pleasure-seeking principle, the maximization of utility – that is, the best satisfaction of preferences.

![Figure 2.3 The indifference map](image)
2.2 The consumer’s feasible set and budget constraint

Of course the consumer cannot buy everything he or she wants; only certain bundles of consumer goods can be afforded. There are two main constraints on the consumer pursuing utility maximization:

- income
- the price of the goods to be purchased.

For example, a consumer receiving income support of £45 a week will be unable to purchase a basket of goods that costs £60 at the supermarket. The restrictions of income and price are embodied in the individual’s feasible consumption set and budget constraint.

### Feasible consumption set

A consumer’s feasible consumption set is the set of all consumption bundles that can be afforded at current prices with the consumer’s income.

### Budget constraint

A consumer’s budget constraint is the frontier of his or her feasible consumption set. It represents the consumption bundles that can be afforded if all the consumer’s income is spent.

Assume that this time our individual chooses between two goods: food (good F) and alcohol (good G). Each can of food costs £9, as does each bottle of alcohol. With an income of £45, how much of each good will he decide to consume? To model this we need to represent the budget constraint by drawing a straight line, as shown in Figure 2.4.

Each point on the line represents a combination of goods F and G which our individual can purchase given his income and the price of the goods. At A, he purchases five cans of food which, at a price of £9 each, would use up all his income of £45. In this case he would spend none of his income on alcohol. At B, he would purchase three cans of food (at a total cost of £27) and two bottles of alcohol (a total cost of £18); this also adds up to the full £45 of income. At the other...
extreme, if he chooses not to buy any food, all of the £45 could be spent on five bottles of alcohol, as shown at C.

Note that the line does not just account for whole bottles of alcohol and cans of food, since it joins up all infinitesimal combinations of the two goods, down to fractions of grammes and millilitres. Note also that the individual could choose point D where only £27 is spent on two cans of food and a bottle of alcohol.

The question which we can now ask is ‘Which combination of food and alcohol will the individual choose?’ To provide an answer, the consumer’s indifference map needs to be brought back into the picture. Our individual will have particular preferences for food and alcohol which are represented by his indifference map. Given these preferences, and given the budget constraint, his objective is to maximize utility by reaching the highest possible indifference curve.

In Figure 2.5 the point of utility maximization is represented by A where the individual consumes three units of good F and two units of good G. At A, the indifference curve is tangential to (just touches) the budget constraint. Indifference curves any further out would not meet the budget constraint and would, therefore, be unattainable; indifference curves further towards the origin represent less preferred options to bundle A.

Bundle L is preferred to bundle A but is not affordable, since it lies beyond the budget constraint. Bundle D, on the other hand, is affordable but gives less satisfaction than A. Bundle T costs as much as A, but gives only as much satisfaction as D. Bundle K is not affordable even though it lies on the same indifference curve as A. The optimum bundle to chose is bundle A, the point of utility maximization, given the constraints of income and price. At this point the consumer’s indifference curve just touches the budget constraint and the consumer reaches the highest indifference curve possible, given the budget constraint.

**Exercise 2.1**

Assume that a schoolgirl has £10 pocket money per week. She spends all of her income on sweets and soft drinks. In her local shop a bag of sweets costs £2 and a can of Coca-Cola costs £1.

1. Draw a diagram showing this schoolgirl’s budget constraint.
2. Draw an indifference curve on the same diagram to show which bundle of sweets and chocolate she might choose.
The indifference curve approach has been used for the analysis of a whole range of individual choice decisions. It has not been restricted to choosing between items of consumption from the supermarket but has been applied to many other decisions, from the choice of school for your children to your preferences for the environment and military defence. One particularly important area of choice, which is examined in Chapter 5, is the choice between leisure and income from working.

### Utility maximization with a budget constraint

Your understanding of economic theory can often be improved if a little mathematical language is introduced. In the case of neoclassical consumer theory this involves consideration of the mathematical properties of both the indifference curve and the budget constraint.

#### The indifference curve

The slope of the indifference curve at point A in Figure 2.6a can be calculated by drawing a dashed line which is tangential to the indifference curve at this point. The slope of the indifference curve at A can be calculated in terms of the rise and the run of this dashed line (see Chapter 9, Changing Economies).

The rise of this line is represented by $\Delta F$ which is negative because the line is downward sloping, that is, there is a fall in the amount of good $F$ as the amount of good $G$ increases. The run of the line is represented by $\Delta G$. It follows that:

$$\text{slope of indifference curve} = \frac{\text{rise}}{\text{run}} = \frac{\Delta F}{\Delta G}$$

Because $\Delta F$ is negative, so also is this slope. Not taking account of whether the slope is positive or negative, we find that its magnitude equals the marginal rate of substitution of good $G$ for good $F$ ($\text{MRS}_{G,F}$). It shows the rate at which the individual gives up good $F$ for good $G$ while remaining on the indifference curve. Hence:

$$\text{MRS}_{G,F} = -\frac{\Delta F}{\Delta G}$$

#### The budget constraint

The mathematical formula for the budget constraint is:

$$Y = P_F F + P_G G$$

where $Y$ represents money income and $P_F$ and $P_G$ are the respective prices of goods $F$ and $G$. The term $F$ represents the amount of good $F$ the individual consumes, while $G$ is the amount of good $G$ consumed.

**Figure 2.6** The mathematical properties of the indifference curve and the budget constraint
The above formula shows the constraint on the individual's budget if all income is spent on goods \( F \) and \( G \).

Using this formula we can establish where the budget constraint cuts the horizontal and vertical axes in Figure 2.6b. It cuts the horizontal axis at point C where the individual allocates all income to good \( G \), so \( F = 0 \). Inserting \( F = 0 \) in the formula for the budget constraint gives:

\[
Y = P_G G
\]

Thus \( G = \frac{Y}{P_G} \) at the point C where the budget constraint cuts the horizontal axis.

On the vertical axis, all of the individual's budget is allocated to good \( F \), so \( G = 0 \). Thus at point B on the vertical axis, inserting \( G = 0 \) in the budget constraint gives:

\[
Y = P_F F
\]

So \( F = \frac{Y}{P_F} \) at the point B where the budget constraint cuts the vertical axis.

Having found points B and C, we can now examine the slope of the budget constraint in Figure 2.6b. As the amount of good \( G \) consumed increases, the amount of good \( F \) the consumer can afford decreases so the budget constraint is downward sloping and hence its slope is negative. We can measure this line's rise and run along the axes, so that its slope is given by:

\[
\text{slope} = \frac{\text{rise}}{\text{run}} = -\frac{OB}{OC}
\]

Now, since the distance \( OB \) is equal to \( \frac{Y}{P_F} \) and the distance \( OC \) is equal to \( \frac{Y}{P_G} \) the slope can be written as:

\[
\text{slope} = -\frac{Y}{P_F} = -\frac{P_G}{P_F}
\]

Hence the magnitude of the slope of the budget constraint equals the price ratio:

\[
\frac{P_G}{P_F}
\]

It follows that the original formula for the budget constraint can be re-expressed in terms of its slope and intercept. If, as before:

\[
Y = P_F F + P_G G
\]

then dividing by \( P_F \) gives:

\[
\frac{Y}{P_F} = F + \frac{P_G}{P_F} G
\]

which by manipulation means that:

\[
F = \frac{Y}{P_F} - \frac{P_G}{P_F} G
\]

The budget constraint has an intercept \( \frac{Y}{P_F} \) (where the budget line cuts the vertical axis) and slope \(-\frac{P_G}{P_F}\) (which is negative because the budget constraint is downward sloping). In economic terms this means that the individual's budget constraint can be worked out from:

- real income – the amount of good \( F \) that can be purchased for money income \( Y \)
- relative prices – the ratio of the price of good \( G \) to good \( F \).

The condition for utility maximization

The consumer maximizes utility by choosing the point on the highest possible indifference curve he or she can get to, given the budget constraint. Because indifference curves are convex and so bow in towards the origin, the point of greatest utility on any budget constraint will be not at one of its end points, but somewhere in-between at the point where the budget constraint just touches the highest indifference curve it can reach. This is point A on Figure 2.6c. At this point the indifference curve and the budget constraint have the same slope. So at this point of utility maximization, the slope of the indifference curve \( \frac{\Delta F}{\Delta G} \), is equal to the slope of the budget constraint \( -\frac{P_G}{P_F} \) Therefore \( \frac{\Delta F}{\Delta G} = -\frac{P_G}{P_F} \) and so \( -\frac{\Delta F}{\Delta G} = \frac{P_G}{P_F} \).

This means that at the point of utility maximization, the marginal rate of substitution between two goods (\( \text{MRS}_{GF} \)) is equal to their price ratio:

\[
\text{MRS}_{GF} = \frac{P_G}{P_F}
\]

This condition for utility maximization along a budget constraint depends on consumers having diminishing marginal rates of substitution and thus
2.3 Deriving the demand curve

Having introduced the basics of neoclassical consumer theory, it can now be applied to understanding how an individual would react to an event which is of crucial importance to neoclassical economics – a price change. The effect of a price change is to shift the consumer’s budget constraint.

Consider the effect of a reduction in the price of good $G$, as shown in Figure 2.7(a).

At the initial price level, the consumer maximizes utility at A subject to the budget constraint shown by line ZS. A reduction in the price of good $G$ pivots the budget line to the right to ZT. You can see this by considering what happens if the consumer spends all his or her money on good $G$. When the price of good $G$ falls the consumer can afford to buy more of it than before the price change; T can be reached instead of S. However, point Z on the diagram is unchanged since this shows the amount of good $F$ the consumer could purchase if all income was spent on it; this does not change if neither income nor the price of good $F$ have changed. So ZT is the new budget constraint and, except at Z, the consumer can now afford to buy more of either good $F$ or good $G$ or both, because the price of good $G$ has fallen. The effect of the fall in the price of good $G$ is to shift the budget constraint to the right.

**Figure 2.7** A reduction in the price of good $G$
G is to pivot the budget line around point Z from line ZS to line ZT on the diagram.

The shift in the budget constraint means the consumer can move onto a higher indifference curve. If A was the point of maximum utility on the previous budget constraint, then, on the new budget constraint, a higher indifference curve can be reached by maximizing utility at B. In response to the reduction in price, consumption of good G increases from $G_1$ to $G_2$ units.

We can represent the effect of the reduction in price shown in Figure 2.7(a) by drawing the individual's demand curve. When the price of good G falls from $P_1$ to $P_2$, the amount of good G the consumer wants to buy increases from $G_1$ to $G_2$. This is translated into a demand curve in Figure 2.7(b), showing the relationship between price and demand.

**Exercise 2.2**

In Figure 2.5 the indifference curve is tangential to the budget constraint at A. Try drawing this diagram on a separate piece of paper. By taking another look at what happened in Figure 2.7, see if you can show on your diagram the effect on the budget constraint of:

1. an increase in the price of good G
2. a reduction in the price of good F.

For each of your answers show a new point of utility maximization after the price change.

**2.4 Market demand and consumer sovereignty**

The demand curve in Figure 2.7(b) represents the behaviour of an individual consumer. To find the market demand curve we need to add up the demand curves of all the consumers for a particular good.

If there are two consumers in a market, Mr A and Mr B, then the demand curves for the two consumers could be added together, as in Figure 2.8.

At a price of £2, Mr A demands two units of good G and Mr B demands four units; market demand is, therefore, six units. For each price level, the amount demanded by the two consumers is added up to derive the market demand curve. (See Changing Economies, Chapter 7, Section 5.1)

The market demand curve can then be used to demonstrate that, under certain conditions, a market economy generates consumer sovereignty. Figure 2.9 shows the market demand curve for good G. Now assume that firms plan to supply 400 units of good G at a price of £2 per unit. This is represented by point A on the diagram. The problem is that consumers want to purchase only 200 units of good G at this price, so there is an excess supply of good G. Firms can only sell what consumers are willing to purchase and as consumers wish to purchase only 200 units at a price of £2, this will be all that firms will be able to sell at that price. How firms react to this situation is considered in Chapter 8. However, it is clear that
firms will not want to produce more than they can sell, so if firms continue to charge £2 per unit they will be forced to cut their supply of good $G$ to 200 units (point B). The point to note is that it is consumers who are dictating how many units of good $G$ are produced, not firms, the government nor any other outside body. Sovereignty rests with the decisions of individual consumers.

In demonstrating how consumer sovereignty can be delivered, the market demand curve provides the key building block of the neoclassical approach. We have seen that each consumer has his or her own particular tastes and preferences, and these are reflected in their indifference curves from which their individual demand curves derive. Adding up these individual demand curves to construct a market demand curve is like carrying out a big questionnaire asking how consumers feel about a particular product. In Figure 2.9 firms discover that consumers do not demand the same amount of good $G$ that the firms wish to supply at the current price. This power, which consumers communicate to firms through their decisions in the market, is represented by the market demand curve.

In neoclassical theory, the decisions of firms can be represented by a market supply curve. This is shown by the upward sloping market supply curve $S$ in Figure 2.9, where output increases as the price increases because production becomes more profitable. If the demand curve slopes downwards, there will be a point of equilibrium at which the demand and supply curves intersect. This is point C on Figure 2.9.

The beauty of this mechanism is that these adjustments between supply and demand take place without any intervention from outside the market. Each consumer and firm acts according to their own self-interest and, as if by an ‘invisible hand’, the market delivers. This is not to say that there must be a free market economy for consumer sovereignty to hold. From a neoclassical perspective, which judges an economy by its outcome, it is conceivable that the government could carry out a survey and find out from consumers what should be produced. However, the strength of a free market economy is its simplicity. There is no need for social scientists to design complicated questionnaires and conduct surveys of consumer opinion. Individuals communicate their tastes and preferences through their everyday demand decisions in the marketplace.

The market supply curve is derived by assuming competition between a large number of firms, in

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**Figure 2.9** A demonstration of consumer sovereignty

![Diagram](image-url)
which no single firm can influence the price level. If this assumption was relaxed and, say, one firm dominated a particular market, a degree of power would then rest with this particular firm and it could influence the price level; as a result, consumer sovereignty would be compromised. A demonstration of consumer sovereignty, therefore, requires more than just the assumptions about consumer behaviour necessary to derive a downward sloping market demand curve. It requires us to derive an upward sloping supply curve and to make a number of assumptions about the behaviour of firms, in particular, to ensure price taking behaviour in the market in which they operate (see Chapters 1 and 18).

It should also be noted that the scope of this exposition is limited to particular markets for goods. The approach is partial, with each market considered in isolation from others. Unlike general equilibrium theory, in which all markets are interdependent (see Chapter 1), in the partial equilibrium analysis of this chapter there is no feedback between markets.

### Reflection

What are the origins of consumer sovereignty? How do consumers communicate their tastes and preferences to firms?

### The Structure of the Demand Curve

Since the demand curve is so important to the neoclassical approach, this section examines its structure in more detail and evaluates the assumptions that are necessary to derive a downward sloping individual demand curve. This evaluation will provide the basis for discussing some of the limitations of the neoclassical demonstration of consumer sovereignty.

#### 3.1 Income and substitution effects

Changes in price can have two main impacts on the behaviour of consumers. First, in response to a price change, consumers substitute between commodities. For example, if the price of bread falls and that of potatoes stays the same, consumers will substitute between the two commodities, that is, they will reduce their consumption of potatoes and increase their consumption of bread. This is known as the substitution effect of the price change. Second, changes in price have an impact on the income of consumers. A reduction in the price of bread will make consumers better off in real terms and, as a result, they may buy more bread. This is known as the income effect of the price change.

**Substitution effect**

The substitution effect of a price change measures the amount by which a consumer substitutes one good for another, whilst maintaining the same level of utility.

**Income effect**

The income effect of a price change measures the impact on the amount of the good consumed as a result of the consequent change in real income.

These two effects of a price change are shown in Figure 2.10, which provides a more detailed examination of the price change shown in Figure 2.7(a) above. As before, the price of good G falls and the budget line pivots out from line ZS to ZT. The consumer responds to the price change by increasing consumption of good G from A to B. Notice, however, that a new line, labelled RP, has been drawn on Figure 2.10. This new line enables us to split the price change into two separate steps, from A to A' and from A' to B. The first step, A to A', measures the substitution effect of the price change, while the step from A' to B measures the income effect.

The movement from A to A' is the substitution effect. This is based on the propensity consumers have to substitute between commodities in response to a relative price change. The price of good G falls relative to that of good F and the consumer moves along the indifference curve, replacing good F with good G. This is represented by a rotation of the budget constraint along the indifference curve from line ZS to line RP, so that the individual remains on the same indifference curve but now consumes...
more of good $G$ and less of good $F$ because of the price change. In defining the substitution effect, we deliberately keep the consumer at the same level of utility so that the effect of the relative price change then can be isolated.

Assume, for example, that good $F$ represents jam and good $G$ marmalade. If the price of marmalade (good $G$) falls, a typical consumer may substitute out of jam and buy marmalade instead. The substitution effect measures the amount by which the consumer substitutes marmalade for jam in response to a price change while maintaining the same level of utility. Substitution effects always work in the same direction. As a good becomes relatively cheaper, consumers substitute it for other goods and buy more of it.

The second part of the price change is the income effect, the movement from $A$ to $B$ in Figure 2.10. In the example of marmalade given above, a fall in its absolute price, other things being equal, improves the real income of the consumer as more can be bought than before. The income effect measures the effect of this change in real income on the amount of marmalade consumed. As we shall see, income effects can work in either direction. Sometimes consumers buy more, sometimes they buy less of a good, as income rises.

The effect of such an increase in real income can be represented by shifting the budget constraint to the right, from line $RP$ to $ZT$. This increase in income does not affect the slope of the budget constraint, since this depends on the relative prices of goods $F$ and $G$ and this was taken into account in the shift from $ZS$ to $RP$. The budget constraint $ZT$ is therefore parallel to the budget constraint $RP$. It represents the additional amount of both good $F$ and good $G$ the consumer can afford as a consequence of the change in real income.

The total effect of a price change is the combined effect of the income and substitution effects. Substitution, as we have seen, can work in only one direction; as a good becomes relatively cheaper consumers substitute it for other goods. However, income effects can work in either direction. As income rises, people have more to spend, so they may increase their consumption of some goods and not change or even reduce their consumption of other goods.

### 3.2 Giffen goods

Income effects can be very important, as Robert Giffen (1837–1910), a contemporary of Marshall’s, found. Giffen, who examined consumption behaviour during the Irish potato famines, was interested in the effects of a change in the price of a staple food, such as bread or potatoes, on working-class consumption.

The substitution effect suggests that there should be an increase in the demand for bread if its price falls. However, we also have to allow for the income effect and the fact that people will be better off when the price of bread falls. Since bread is a staple part of the working-class diet, a
reduction in its price will leave more income available for the consumption of other goods. Indeed, since they can now afford other, more expensive items, such as meat, people may consume less bread than before its price fell. Instead of filling up working-class stomachs with bread, a different diet, with less bread and more meat, is made possible. The demand for bread could fall in response to a reduction in price, thereby providing an example of a **Giffen good**.

A good is described as Giffen-like or Giffenesque in character if its demand increases in response to a price increase or its demand decreases in response to a price decrease. For the case of bread, this could mean that when its price increases, the detrimental effect on income could result in consumers having to buy more bread. If a good is Giffen-like, the effect of the change in price is positive – a price increase leads to an increase in demand; a price decrease leads to a decrease in demand. Although the Giffen good was originally identified as a nineteenth century phenomenon, it is still relevant to the analysis of the consumption of staple foods by consumers living in poverty today.

Looking back at Figure 2.7 you can see how a downward sloping demand curve can be derived from a consumer’s indifference map diagram. In this case, in response to the fall in the price of good $G$, consumer utility maximization results in more of good $G$ being consumed. When the price of good $G$ falls, the budget constraint moves out to the right from $ZS$ to $ZT$. This reaction to the price fall is shown by the movement from $A$ to $B$ in Figure 2.7(a), which gives a downward sloping demand curve in Figure 2.7(b).

Sometimes, however, the demand for good $G$ will fall when the price of good $G$ falls. In that case, as shown in Figure 2.11(a), instead of moving from $A$ to $B$, the consumer moves from $A$ to $C$ in response to the fall in the price of good $G$. This results in a reduction in the quantity demanded of good $G$ from $G_1$ to $G_2$ units. This possibility cannot be excluded. Depending on the shape of the indifference map, the consumer could maximize utility at either $B$ or $C$ after the price fall.

Figure 2.11(b) shows that the movement to point $C$ results in an upward sloping demand curve. In this example, good $G$ is a Giffen good: as the price of good $G$ falls, the quantity demanded of good $G$ also falls. The universality of the downward sloping demand curve is contradicted by this example of Giffenesque behaviour. Note that this does not mean that all of the demand curve is upward sloping, only that a part of it may take this shape.

The Giffen good can be examined in more detail by splitting up the effect of a price change on consumer demand into two separate parts. Figure 2.12 provides an illustration of how the income and substitution effects interact to give an upward sloping demand curve.

The effect of the reduction in the price of good $G$ is broken down into a substitution effect, from $A$ to $A'$, and an income effect, from $A'$ to $C$.

The substitution effect always goes in the same direction (provided the indifference curves are convex). It is the income effect that drives the reduction in the quantity demanded of good $G$. As a result of the price reduction, when real income increases, the individual in this case reduces consumption of good $G$ and increases consumption of good $F$.

Income effects can go in one of two directions, and therefore we can distinguish between two types of goods, both of which are illustrated in Figure 2.13. The first, illustrated in Figure 2.13(a), is a *normal* good. The demand for good $G$ increases from $G_1$ to $G_2$, when there is a parallel shift of the budget constraint as income increases. In calling such a good ‘normal’, the presumption is that it is normal for the consumption of a good to increase as real income increases and fall as real income falls.

Figure 2.13(b), on the other hand, shows what happens if good $G$ is an *inferior* good. As income increases, consumption of good $G$ falls from $G_1$ to $G_2$ units. This fits the Giffen example in which consumers can afford to buy less bread as real income increases. Conversely, if income falls
consumers buy more of a Giffen good since they cannot afford more expensive goods.

**Inferior good**

A commodity is defined as inferior if its consumption falls as income is increased and, conversely, its consumption increases when income is reduced.

Whether or not a good is inferior is crucial to whether its demand curve is upward sloping. If consumption of a good falls as income increases, it is possible that the quantity demanded will also fall if the price of the good is reduced. However, the income effect in this case would have to be strong enough to outweigh the substitution effect, which we know will increase the quantity demanded of a good whose price has fallen.

Figure 2.14 shows three different outcomes of the reduction in the price of good G. If the outcome is to shift consumption from point A to point D, good G is *weakly inferior*. The income effect works in the opposite direction to the

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve

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**Figure 2.11** Deriving an upward sloping demand curve
substitution effect but is not strong enough to wipe it out. If the outcome is point D, therefore, good G is inferior but is not a Giffen good, since its demand still increases in response to the reduction in its price. This contrasts with an outcome at point C which would mean that good G is strongly inferior. In this case, good G is a Giffen good as the income effect works in the opposite direction to the substitution effect and is strong enough to wipe it out. There is a

Figure 2.12  Explaining Giffenesque behaviour

![Diagram](attachment:image)

Figure 2.13  The direction of the income effect

![Diagram](attachment:image)
fall in the consumption of good \( G \) in response to its price reduction.

If the outcome is at point B, good \( G \) is normal. The income and substitution effects work in the same direction and there is a rise in the consumption of good \( G \) in response to the price reduction.

It follows that since strongly inferior goods or Giffen goods are an economic possibility, demand curves cannot automatically be assumed to be downward sloping. Indeed, Zamagni (1987) argues that the general shape for such a demand curve is a backward S-shape. Figure 2.15 shows the shape of a

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**Figure 2.14** Different outcomes as a result of a price reduction

**Figure 2.15** The backward S-shaped demand curve

Source: Adapted from Zamagni, 1987, p.153
market demand curve which could conceivably be derived from aggregating individual backward S-shaped demand curves.

Most of the demand curve is downward sloping but there is also an upward sloping part to the curve which derives from Giffenesque behaviour. In general, goods that are Giffenesque behave in this way at some price levels but not at others.

A market supply curve, similar to the one you saw in Figure 2.9, has also been drawn on Figure 2.15. This supply curve is upward sloping because firms increase their supply of a good as the price level increases. If, however, the demand curve is a backward S-shape, a unique equilibrium of demand and supply will not occur. In Figure 2.15 there are three possible equilibria. Giffen goods, with their demand curves that do not consistently slope downwards, therefore create problems for the neoclassical model of demand and supply.

The possibility of multiple equilibria weakens the demonstration of consumer sovereignty which the neoclassical model can provide. If there are several possible equilibria, consumers are not giving a unique answer to the question ‘How much of good G should be produced?’ Consumers are not so much dictating to firms what to produce, as giving them a number of options.

### 4.1 Lexicographic preferences

**Question**

Assume that you are unemployed and have £20 available for your weekly shopping bill. Since money is tight you have to draw up a shopping list in advance of your trip to the supermarket. Choose a selection of items on which to spend your £20 from the following alternatives:

<table>
<thead>
<tr>
<th>Item</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet rolls</td>
<td>4.25</td>
</tr>
<tr>
<td>Tea bags</td>
<td>2.39</td>
</tr>
<tr>
<td>Red wine</td>
<td>7.99</td>
</tr>
<tr>
<td>Chicken</td>
<td>5.33</td>
</tr>
<tr>
<td>Mild Cheddar</td>
<td>3.00</td>
</tr>
<tr>
<td>Minced lamb</td>
<td>3.19</td>
</tr>
<tr>
<td>Back bacon</td>
<td>4.10</td>
</tr>
<tr>
<td>French lager</td>
<td>10.99</td>
</tr>
<tr>
<td>Papaya shampoo</td>
<td>2.99</td>
</tr>
<tr>
<td>Hair conditioner</td>
<td>3.99</td>
</tr>
<tr>
<td>Tomato ketchup</td>
<td>2.30</td>
</tr>
<tr>
<td>Chardonnay</td>
<td>5.99</td>
</tr>
</tbody>
</table>

Your choice depends to some extent on your preferences among these goods. You may prefer lamb to chicken, and you may prefer to drink red wine rather than French lager. You are, however, considerably constrained in your choice because you have only £20 to spend. For example, it would not be feasible, within your budget, to buy French lager, red wine, and Chardonnay. By contrast, I can introduce you to a man who could afford all three of these items, and more. Here are the items purchased by the English actor Paul Bradley (who used to play Nigel in EastEnders) during one trip to the supermarket.

Paul is able to spend over £192 during his trip to the supermarket, and the table reveals the host of consumption items he is able to choose. In his case he is able to afford French lager, red wine and Chardonnay.

The simple point which this comparison illustrates is that the degree of choice we can exercise in our consumption depends on our level of income. For Paul Bradley, the *People’s* psychologist Jane Firbank reports, ‘Cooking is obviously a great adventure for Paul and he gets great fun from looking after his family’. This could not generally be said for the unemployed person trying to survive on £20 a
week, where surviving is more likely to be a nightmare than an adventure.

For the individual whose income is restricted, outlay must be directed towards the satisfaction of certain basic needs. He must eat, of course, so food will be a priority in his consumption basket. He probably has to decide how much food is required before allocating his income to less important items such as hair conditioner. Food obviously satisfies a more basic need, his hunger, than conditioner which helps his appearance. We can now consider the implications of this type of choice for an individual's indifference map.

Consider the consumption of food and hair conditioner by a 30 year old male. According to the Medical Research Council, 'an average 30 year old man needs between 2,500 and 3,500 caloric units a day, whereas a woman will use up only between 1,750 and 2,250' (Cathie, 1976, p.11). Let us say that this man consumes only 2000 calories of food and 20 millilitres of hair conditioner. This bundle is represented by A on Figure 2.16.

At this level of consumption he is still hungry, so bundle A is preferred to any combination of food and conditioner which involves less than 2000 calories a day. If, for example, he consumed 1000 calories a day and 30 millilitres of conditioner, point B, this would give him less utility than his 2000 calories and 20 millilitres of conditioner at A. All bundles which are below the horizontal line in Figure 2.16 are, therefore, worse than A.

Further, because 2000 calories per day leaves him still hungry, all bundles above the horizontal line are better than bundle A. If, for example, the consumer can increase his consumption of food to 3000 calories per day, and only consume 10 millilitres of conditioner, point C, he will prefer C to A. All points to the right of point A on the horizontal line are preferred to A, and all points to the left are less preferred than A.

All points on the diagram, therefore, are either preferred to A or less preferred than A. Since there are no points on the diagram which the consumer regards with indifference, as compared to point A, it follows that there is no indifference curve which passes through this point. This example demonstrates the non-existence of indifference curves for some consumers. The individual who prioritizes a certain category of consumption, such as food, displays what are called lexicographic preferences. This term is based on the layout of a dictionary, where the letter A is always before the letter B regardless of which letters follow. The word Aztec always comes before Baptist.

Source: The People, 16 June 1996, p.21
even though the second letter of Aztec (letter z) comes long after the second letter in Baptist (letter a). The same happens with our hungry consumer’s consumption of food, which always comes before his consumption of hair conditioner.

**Lexicographic preferences**

A system for ranking preferences in which the individual gives priority to particular items of consumption.

Admittedly, this is an extreme example in which the individual places absolute priority of food over hair conditioner. In practice there may be some, if only limited, substitution between goods. The point to be made, however, is that to the extent that individuals prioritize their consumption to satisfy particular needs, the indifference map is of limited relevance to understanding their behaviour.

The non-existence of indifference curves when consumers give priority to satisfying a particular need means that there will be no substitution effect in response to a price change. Changes in demand will be driven by the income effect alone. This weakens the notion of consumer sovereignty as some consumers are too poor to have decisions to make. For example, most of the items on Paul Bradley’s shopping list would never be bought by someone with the budget constraint of the unemployed. In communicating to the market whether they prefer, say, red wine to Chardonnay, the poor may not even be consulted. In the quotation at the start of this chapter, Enoch Powell argued that even the poorest members of society are not disfranchized in the great ballot of consumer democracy. The question to be asked, however, is how much weight is given to the votes made by people on different levels of income? It can be argued that for many of the goods which are stacked on supermarket shelves, the poor are excluded from the consumer ballot.

In this view, consumer sovereignty depends on level of income. In the ballot of consumer democracy, those with more money are able to cast votes that have more effect than those with less money.

### 4.2 Consistency

Thus far we have examined two possible problems with consumer sovereignty. First, Section 3.2 showed that demand curves may not be downward sloping. This means that there may be more than one place where market demand and supply curves intersect.
so there may not be a unique equilibrium price and quantity. Consumer demand may be satisfied by a number of different possible equilibrium prices, each corresponding to a different equilibrium quantity, so that how much is produced cannot be determined by consumers alone.

Second, we saw in Section 4.1 that consumers can influence only those markets they enter. In practice we do not buy small quantities of everything. Many consumers, therefore, have no influence in many markets. In particular, the poor, through having less money to spend, will have less influence than the rich. Consumer sovereignty is not egalitarian.

This section will raise a third problem with the neoclassical demonstration of consumer sovereignty. Neoclassical theories of consumer sovereignty depend upon assumptions about the consistency of human behaviour which may not hold. Section 3.2 showed that the effect of a price change could not always be predicted because income effects may work in the opposite direction and outweigh substitution effects, as they do for Giffen goods. However, it is usually assumed that the ‘Law of Demand’ is met, that is that substitution effects always work in one direction – they are always negative. In this section I will show how this assumption of negative substitution effects can be tested by examining the consistency of consumer preferences. To do this I must first introduce you to some additional concepts which are used in consumer theory. These will help to prepare you for a case study in experimental economics at the end of this section.

**The Slutsky approximation**

In any application of the neoclassical theory of consumption, one of the key problems is that indifference curves, which provide its theoretical core, cannot be observed. We cannot, as it were, peep into the heads of each consumer and find out their preferences among the vast array of consumption goods that are on offer. We cannot plot an individual’s indifference curve using real world data.

To overcome this measurement problem, economists make an approximation which was first developed by the Russian economist Eugene Slutsky (1880–1948). This can be illustrated by once again considering a reduction in the price of good \( G \). Figure 2.17, which models the same price change as Figure 2.10 earlier, shows that if the price of good \( G \) falls, the consumer moves from the original bundle at \( A \) to a new bundle \( B \). The impact of this price reduction is made up of the substitution effect (from \( A \) to \( A' \)) and the income effect (from \( A' \) to \( B \)).

The substitution effect from \( A \) to \( A' \) is clearly negative, since the reduction in the price of good \( G \) induces the individual to consume more of good \( G \). Indeed, the substitution effect must always be negative if the indifference curve is convex, as shown in Figure 2.17. You can see that in splitting up the impact of the price change into the substitution effect and the income effect, the line \( RP \) is drawn parallel to \( ZT \) and tangential to the indifference curve that runs through \( A \). If the indifference curve is convex, that is, if it bows in towards the origin, the point of tangency, \( A' \), of the line \( RP \) and the indifference curve which
runs through A must be to the right of A. There must be a negative substitution effect.

The key thing to notice about Figure 2.17 is that to examine the substitution effect in isolation, we would need to specify an income effect. This income effect compensates for the effect of the price change by keeping the individual on the same indifference curve. It is referred to as a compensating variation. (In this case the compensation is negative because the individual gains from the price reduction – the compensation would be positive under a price increase.) The compensating reduction in income is represented by the parallel shift of the budget constraint from ZT to RP.

**Compensating variation**

Following a change in price, the compensating variation measures the amount of real income that would have to be given to the consumer to ensure the same level of utility.

However, since the indifference curve is not observable we can observe neither the substitution effect nor the income effect. To test whether the substitution effect is negative we must modify the model in some way, using observable data.

Now to make an approximation of the income effect, using information which is at our disposal, a new line ML can be drawn which is close to RP, provided the price change is small, and parallel to it. This new line is drawn through point A. This is because we can observe how much of good F and good G the individual chooses in the original bundle A. In drawing this new line we make what is known as a Slutsky approximation to the income effect. Instead of trying to find out how much income, after the price change, is needed to keep the individual on the same indifference curve, we can observe how much income is required to enable the individual to afford the original bundle of goods at A. We make a Slutsky approximation of the compensating variation, often referred to as the Slutsky compensating variation.

**Revealed preferences**

With the Slutsky approximation at our disposal we can devise a simple test of consumer theory. To complete this task I shall now introduce the idea of revealed preference, originally developed by Samuelson (1938). This can be explained by once again considering a reduction in the price of good G. Figure 2.18 shows that, as before, the individual moves from bundle A to B after the price change, but...
the Slutsky approximation to the income effect is established by drawing the line ML through A.

The Slutsky approximation to the substitution effect, more commonly known as the Slutsky substitution effect, is represented by the movement from A to A*. The Slutsky approximation to the income effect, again more commonly known as the Slutsky income effect, is represented by the movement from A* to B.

We saw earlier that if the indifference curve is convex then the substitution effect must be negative. We can also prove that the Slutsky substitution effect must also be negative. Consider the choice the individual made before the price change, when his or her budget constraint was ZS. Bundle A was preferred to all other bundles that could have been afforded within the confines of the budget. Any of the combinations of goods F and G on the budget constraint ZS, and any of the bundles within the feasible set to the left of the budget constraint could have been afforded, for example bundle D in Figure 2.18. The individual could have afforded D but chose bundle A. Indeed, we can say that A is revealed to be preferred to D. By choosing A when D could have been afforded, the individual displays a revealed preference for A over D.

**Revealed preference**

By purchasing a particular bundle of goods, an individual reveals that this bundle is preferred to all other affordable bundles.

Now consider the behaviour of the individual after the price change. If we make a compensating variation of income, in order to isolate the substitution effect, you can see that the individual can now choose a new bundle from the line ML. Will the substitution effect be negative for this consumer?

In asking this question we can establish whether the individual satisfies a basic assumption of neoclassical consumer theory, namely that of consistency, which was defined earlier in Section 2. If an individual prefers A to D then, to be consistent, he or she must never prefer D to A.

**Question**

On the new line ML in Figure 2.18, to show consistent behaviour which of bundle A* or bundle D should an individual choose?

The individual’s behaviour would be consistent only if bundle A* was chosen, since this bundle was not affordable before the price change: choosing bundle D after the price change would be inconsistent behaviour. Before the price change the individual revealed a preference for A compared to D; both were affordable and he or she chose A rather than D.

Consistency requires that after the price change, the individual chooses bundles that fall on the new budget line ML at or to the right of point A. Choosing bundles on the new budget line to the left of point A would be inconsistent. These bundles, since they lie within the original budget constraint ZS, could have been chosen before the price change. Choosing a bundle somewhere between A and L results in an increase in the demand for good G. So consistency requires that a compensated reduction in the price of good G must result in an increase in the demand for good G or perhaps no change in its demand. A reduction in the price of good G cannot consistently result in a fall in its demand. Again this is a negative (or zero) substitution effect, in which the price of good G and its (compensated) demand cannot move in the same direction.

This result enables us to test one of the cornerstones of neoclassical consumer theory, its assumption of consistency. To test consistency by the revealed preference approach and the Slutsky approximation requires only data which are observable, bundles of goods and their prices. We did not need to know anything about indifference curves to draw Figure 2.18; only observable bundles of goods are needed.

In applying this methodology to test for consistency there are two strategies which economists follow. The first is to examine consumers’ behaviour over time. A test for analysing time series data has been developed by Varian (1982). The basic approach is to observe consumption patterns at different points of time, and assess whether consumers behave consistently. The problem with this approach, however, is that one cannot be sure that tastes are stable over time. A consumer may appear to behave inconsistently, but it may be instead that his or her tastes have changed and that the observed behaviour is a consistent reflection of the consumer’s changed taste.

A second research strategy is to carry out some experimental economics by simulating in a laboratory the choices facing consumers. The advantage
of this approach is that the economist can, to some extent, control the environment in which individuals make their decisions. An economist using non-experimental data lacks any control over the many factors which influence economic behaviour. However, the experimental economist can ensure in the laboratory situation that choices are effectively simultaneous in order to overcome the problem of changes in tastes over time.

### Experimental economics

Where economic theory is tested using laboratory conditions which simulate real-life economic situations.

### An experiment to test consistency

In order to test whether consumers made consistent choices, Sippel (1997) invited groups of students to take part in two separate experiments, one in June 1993 and the other in February 1995. In the first experiment, 12 subjects took part and in the second, 30 students were used. Each subject was given a fixed budget within which he or she could purchase a bundle of goods to be consumed over a period of one hour. Table 2.1 shows the goods that were available.

<table>
<thead>
<tr>
<th>Goods offered</th>
<th>Description</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video clips</td>
<td>Watching a videotape of rock and pop music video clips</td>
<td>30–60 mins</td>
</tr>
<tr>
<td>Computer games</td>
<td>Playing ‘Super Blast’ (in the first experiment) or ‘Pinball’ (in the second experiment)</td>
<td>27.5–60 mins</td>
</tr>
<tr>
<td>Magazines</td>
<td>Reading a selection of newspapers and magazines</td>
<td>30–60 mins</td>
</tr>
<tr>
<td>Coca-Cola</td>
<td>Cold soft drink</td>
<td>400–2000 grammes</td>
</tr>
<tr>
<td>Orange juice</td>
<td>Cold drink</td>
<td>750–2000 grammes</td>
</tr>
<tr>
<td>Coffee</td>
<td>Prepared when demanded</td>
<td>600–2000 grammes</td>
</tr>
<tr>
<td>Haribo</td>
<td>Popular brand of sweets</td>
<td>400–2000 grammes</td>
</tr>
<tr>
<td>Snacks</td>
<td>Pretzels, peanuts etc.</td>
<td>600–2000 grammes</td>
</tr>
</tbody>
</table>

To test for consistency, the subjects were confronted with ten different budget constraints, each budget constraint involving a different set of prices for the goods shown in Table 2.1. The subjects were asked to choose their optimum bundle for each of the different budget constraints. However, they were allowed to consume only one of their chosen bundles, selected at random by a computer, at the end of the experiment. By having his subjects make their choices effectively simultaneously, that is, before any consumption took place, Sippel provided a possible way of overcoming the problem of changes in taste, so that he could then check whether the individuals in his experiments made inconsistent choices.

He found that a large proportion of individuals regularly made inconsistent choices. In the first experiment, 11 out of the 12 subjects were inconsistent in some of their choices, and in the second experiment 22 out of 30 subjects were, on occasions, inconsistent.

In assessing the results of his experiment Sippel considers ‘how serious these deviations from optimising behaviour really are’ (Sippel, 1997, p.1439). Two main points can be made. First, just because an individual occasionally breaks consistency does not mean that this individual is generally inconsistent. Sippel qualifies his results by pointing out that only a small proportion of the possible number of violations took place in the experiments. The individuals behaved consistently more frequently than they behaved inconsistently. Second, on a number of occasions, the breaks in consistency may have occurred because alternative bundles of goods had very similar combinations of goods. For example, could the consumer reasonably be expected to compare a bundle with 30 grammes of Coca-Cola and 30 grammes of
coffee with a bundle containing 31 grammes of Coca-Cola and 29 grammes of coffee! As economists we might observe this data as being evidence of consumer inconsistency but, in reality, these bundles are so similar that it may be unreasonable to expect clear rankings between them.

Source: Sippel, 1997

This case study provides an insight into how economists have gone about testing a key assumption of neoclassical economics, but it offers no clear answer as to whether or not reported violations of consistency have serious implications for the neoclassical approach. For most consumers in the experiment, consistency is broken for at least some of their consumption decisions. In defence of the neoclassical approach, however, it can be argued that occasional breaks in consistency do not invalidate consistency as a general assumption of consumer behaviour.

As mentioned earlier, the validity of the consistency assumption has implications for aspects of neoclassical economics beyond the shape of the demand curve and its use in demonstrating consumer sovereignty. The consistency of preferences is central to the application of neoclassical consumer theory to practical policy issues.

### 4.3 Irrational choices

The main thrust of the argument above is that if consumers behave in a consistent manner, there will be a negative substitution effect. Becker (1962), however, argued that even if human behaviour is inconsistent, the demand curve is still likely to be downward sloping. He considered two extremes of human behaviour: ‘On the one hand, households are often said to be impulsive, erratic, and subject to never-ending whim, and on the other hand, inert, habitual, and sluggish’ (Becker, 1962, p.5). Consider Impulsive Ian. He doesn’t waste his time inspecting the price of items in the supermarket, rather, he races round, throwing all and sundry into his shopping trolley.

We can model the behaviour of Impulsive Ian by assuming that he consumes an initial bundle which represents an average of what is available. So if his budget constraint is the line ZS on Figure 2.19, Impulsive Ian will consume the average bundle A which lies on the midpoint between Z and S. Can we now predict how he would react to a price change?

Becker argues that, when faced with a price change, Impulsive Ian is likely to consume a new

![Figure 2.19 Irrational choices](image-url)
bundle to the right of point A, for the simple reason that most of the new budget constraint ML is to the right of point A. More bundles are available on the segment AL than are available on the segment AM. The average bundle is now $\bar{A}$, the midpoint of the line ML.

In his whiz through the supermarket, Impulsive Ian is more likely to throw combinations of goods into his trolley from line AL than from line AM. Amid the erratic throwing of goods into the trolley, $\bar{A}$, represents the mean combination of goods that he is most likely to purchase. Even though he is erratic, this consumer is likely to increase his demand for good G in response to a reduction in its price. ‘The fundamental theorem of rational behaviour, that market demand curves are negatively inclined, is, therefore, also implied by impulsive behaviour …’ (Becker, 1962, p.6).

A similar argument applies to Cautious Colin, the sluggish, habitual consumer. If this consumer starts at point A in Figure 2.19, it might be expected that, out of habit, he will remain at A after the price change. The same follows if he starts anywhere on the segment AS of the budget line. If he chose one of these bundles before the price change he will stick to this choice after the price change. Since these bundles are feasible within his budget after the price change, if he is a creature of habit he will stay on this segment.

However, if Cautious Colin consumes an initial bundle on the segment AZ, the top part of budget line ZS, this is no longer feasible after the price change. Even though Cautious Colin is a bit of a stick-in-the-mud with regards to his consumption, he will reluctantly have to choose a new bundle, since he cannot afford bundles on the segment AZ. In choosing this new bundle he is likely to increase his consumption of good G. This is because his original bundle on line AZ involves less of good G than most of the new line ML. Now that the price of good G has fallen, there is more of good G available, so, in being forced to change his consumption, he is likely to consume more of good G.

Becker concludes that for both impulsive and inert consumers, if there is a substitution effect, it is likely to be a negative. The conclusion has implications, however, for the neoclassical idea of consumer sovereignty. The irrational consumer cannot be said to be sovereign in the marketplace. Impulsive Ian, in his whiz around the supermarket, cannot be said to be dictating to the supermarket and its suppliers what goods should be on display. Indeed, modern retailing techniques enable supermarkets to place and package certain goods such that the erratic consumer is bound to pick them up. Cautious Colin, on the other hand, is so passive that he is oblivious to the array of goods available and he changes his behaviour only when forced to. For consumer sovereignty to hold, he should be forcing suppliers to change their behaviour, not them forcing him to change.

For some economists, it does not matter whether consumers are consistent or inconsistent, as long as the demand curve is downward sloping. Mishan, for example, argues that constructing the apparatus of consumer theory is a waste of time and energy. The economist ‘would be no worse off if he remained ignorant of all the theories of consumers’ behaviour, accepting the obviously indispensable “Law of Demand” on trust’ (Mishan, 1961, p.1). For Mishan, the downward sloping demand curve is a useful device which enables economists to predict the behaviour of consumers in response to price changes. For him it does not matter whether the demand curve derives from the consistent preferences of consumers. All that matters is the practical application of the concept.

This practical interpretation of one of the techniques of neoclassical economics provides an important strand of opinion. Even though the neoclassical approach can be used to show how the free market delivers consumer sovereignty, many neoclassical economists are not concerned with such grandiose political statements. For them, techniques, such as the demand curve, are important for the evaluation of a whole range of economic policy changes. Will a tax on fuel, for example, reduce the demand for fuel? Will an increase in the price of oil reduce the demand for cars? Answering these questions does not necessarily involve drawing indifference curves and budget constraints.

However, the neoclassical theory of consumer behaviour is also used for policy analysis. In policy analysis, the question that is asked is whether a policy change would make people better off. Neoclassical welfare economics assumes that what is meant by people being ‘better off’ is that they can better satisfy their preferences, and that whether this is the case can be found out by examining the choices they make as consumers. This is because, according to neoclassical theory, consumers choose whatever option will maximize their utility, given their available budget. Therefore, for policy analysis, the assumptions of neoclassical
theory do matter. This issue is considered in more depth in Chapter 4.

5 Conclusion

This chapter has shown how neoclassical consumer theory can be used to demonstrate consumer sovereignty. In a free market economy, consumers dictate their tastes and preferences to firms through their demand decisions. Every expression of a consumer's preferences represents a vote in the ballot box of consumer democracy and provides the mandate for economic activity.

I have shown that neoclassical consumer theory assumes that consumers have preferences by which they rank different bundles of goods. These preferences are represented by indifference curves from which downward sloping individual and market demand curves can be derived. It is through their demand curves that consumers are able to dictate their preferences to the marketplace.

The downward sloping demand curve shows the response of consumer demand to changes in price. This price change can be analysed in terms of two separate effects: the substitution effect and the income effect. Neoclassical economists tend to emphasize the importance of the substitution effect. The more consumers substitute between alternative bundles of commodities in response to price changes, the more able they are to exercise choice in the marketplace. Critics of the neoclassical approach have tended to emphasize the importance of the income effect. In their view, consumers do not have much freedom to choose between commodities as they are constrained by their levels of income. When income changes, the income effect can override the impact of the substitution effect. The importance of this income effect has been considered in relation to the case of the Giffen good, for which the demand curve can be upward sloping.

A number of key assumptions of neoclassical consumer theory have been considered. The assumption that consumers have indifference curves has been examined for individuals with low income. For these individuals, it was shown that lexicographic preferences can mean that indifference curves do not exist. Using an example from experimental economics, the even more basic assumption that consumers' preferences are consistent was tested. There is some evidence that consumers regularly break consistency, but the consequences of this finding for consumer theory are inconclusive. However, following Becker, it was shown that even if consumers are irrational in their behaviour, their demand curves should still be downward sloping.

In this chapter I have tried to evaluate the neoclassical notion of consumer sovereignty which relies on the assumption that individuals make their choices independently of others in the economy, according to their own particular tastes and preferences. The schoolboy spending his pocket money at the corner shop is not influenced by the proclivity for crisps and chocolate of his schoolmates; the young executive deciding how to spend her salary on clothes and jewellery is not influenced by the consumption decisions of her colleagues; and Lennox Lewis, when deciding whether to buy a helicopter or a yacht, is not influenced by the way in which his opponent spends his purse. He is an individual, his own man, acting independently of other consumers. Here lie the origins of consumer sovereignty, the idea that it is consumers alone who control what goes on in the economy. The next chapter will explore alternative views of consumer behaviour which regard each consumer not as sovereign, but as dependent on the behaviour of other consumers, firms and the wider society in which they are situated.

Further Reading


argues that the income effects of price changes are more important than substitution effects; lexicographic preferences are also considered in detail.


Sippel, R. (1997) ‘An experiment on the pure theory of consumers’ behaviour’, *Economic Journal*: shows in more detail how the experiment in Section 4.2 was carried out and provides a good list of references to the wider literature of experimental economics.

**Answers to Exercises**

**Exercise 2.1**

1. On Figure 2.20, cans of Coca-Cola are measured along the horizontal axis and bags of sweets along the vertical axis. If the schoolgirl spends all her £10 on sweets, at a price of £2 per bag, she can afford to buy five bags. This establishes the point where the budget constraint meets the vertical axis. If she spent all the £10 on Coca-Cola, at a price of £1, then she could afford ten cans. This establishes the point where the budget line meets the horizontal axis.

2. At the point she chooses, an indifference curve just touches the budget constraint; point A on Figure 2.20 is a possible outcome.

**Exercise 2.2**

1. Since the price of good $F$ is constant, the budget line swivels around point $Z$: since the price of good $G$ has increased, the budget line must move to the left, from $ZS$ to $ZT$. The price increase means that less of both good $F$ and good $G$ is available to the consumer within the confines of the new budget constraint. See Figure 2.21a.

2. Since the price of good $G$ is constant, the budget line swivels around point $Z$: since the price of good $F$ falls, the budget line shifts upwards, with more of both goods $F$ and $G$ available to the consumer. See Figure 2.21b.
Figure 2.21a  An increase in the price of good G

Figure 2.21b  A reduction in the price of good F