Topic: Consumer Behaviour

Comparative Statics, and Decomposition of Price Effect into Substitution Effect and Income Effect

(based on Varian book)

Let's see how the demand for a good changes as prices and income change. Studying how a choice responds to changes in the economic environment is known as comparative statics.

1. ***Change in income*** (we hold prices fixed at initial levels)

Let's see how a consumer's demand for a good changes, i.e. how does the optimal consumption change when income changes. As his income changes, the budget line of the consumer shifts outward/inward in a parallel fashion.

OFFER CURVE:

- We can connect together the demanded bundles that we get as we shift the budget line outward to construct the **income offer curve**. If both goods are normal goods, then the offer curve will have a positive slope.
- When we plot the optimal choice of any good against income, *m*, we get the Engel curve. Say, the Engel curve for good X can be constructed by plotting (x_0, M_0) and (x_1,M_1) in the X-M plane. Engel curve for a normal good is positively sloped, while Engel curve for an inferior good is negatively sloped.

Case I: Normal Goods: The demand for such a good would increase when income increases. Here, both X and Y are normal goods since consumption of both increases.

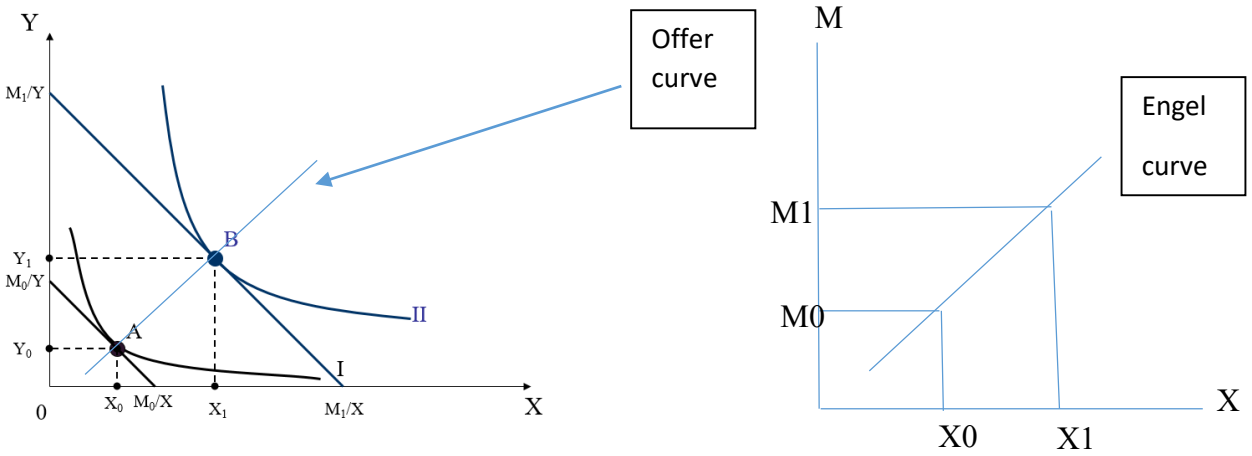


Fig. 1

Case II: Inferior Goods: The demand for such a good would decrease when income increases. Examples might include gruel, potatoes, or nearly any kind of low-quality good. Here, Y is an inferior good while X is normal since with change in income consumption of X increases from A to B, but consumption of Y decreases.

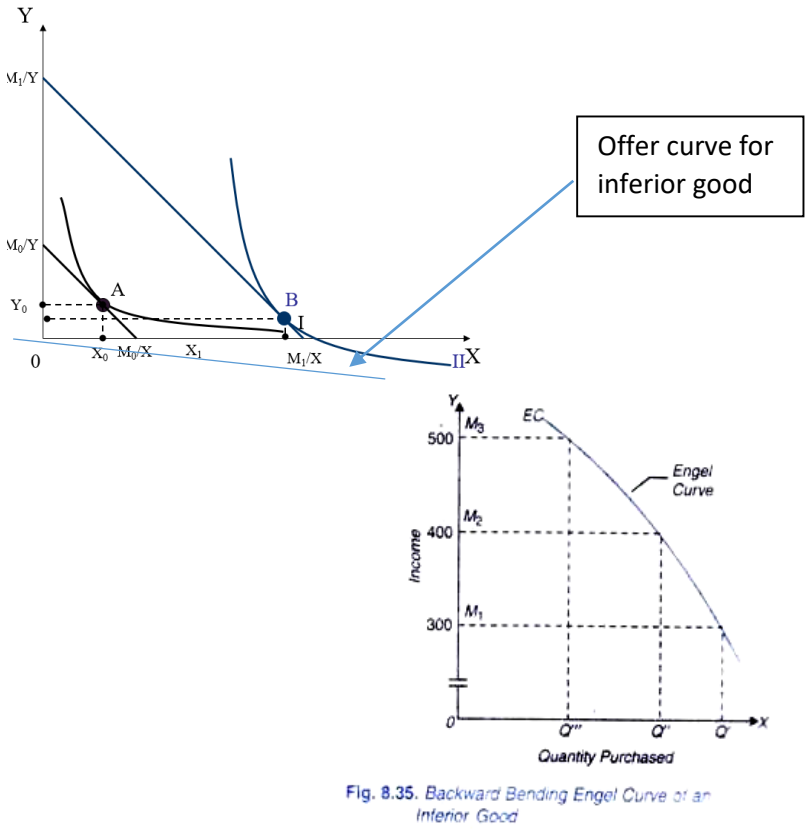


Fig. 8.35. Backward Bending Engel Curve of an Inferior Good

Fig. 2

Whether a good is inferior or not depends on income. Say, potatoes. Potatoes can behave like a normal good at low income levels, after a certain point, with income increase the individual may start to consume more of other food products and less potatoes. So now, potato has become an inferior good.

2. ***Change in own price*** (we hold price of other good and income fixed at initial level)

Suppose, we decrease the price of good 1 and hold the price of good 2 and money income fixed. The quantity demanded of good 1 has increased.

PRICE OFFER CURVE AND DEMAND CURVE:

We can connect together the optimal points to construct the price offer curve. This curve represents the bundles that would be demanded at different prices for good 1.

The associated demand curve can be constructed by plotting the optimal choices of good 1 at different prices.

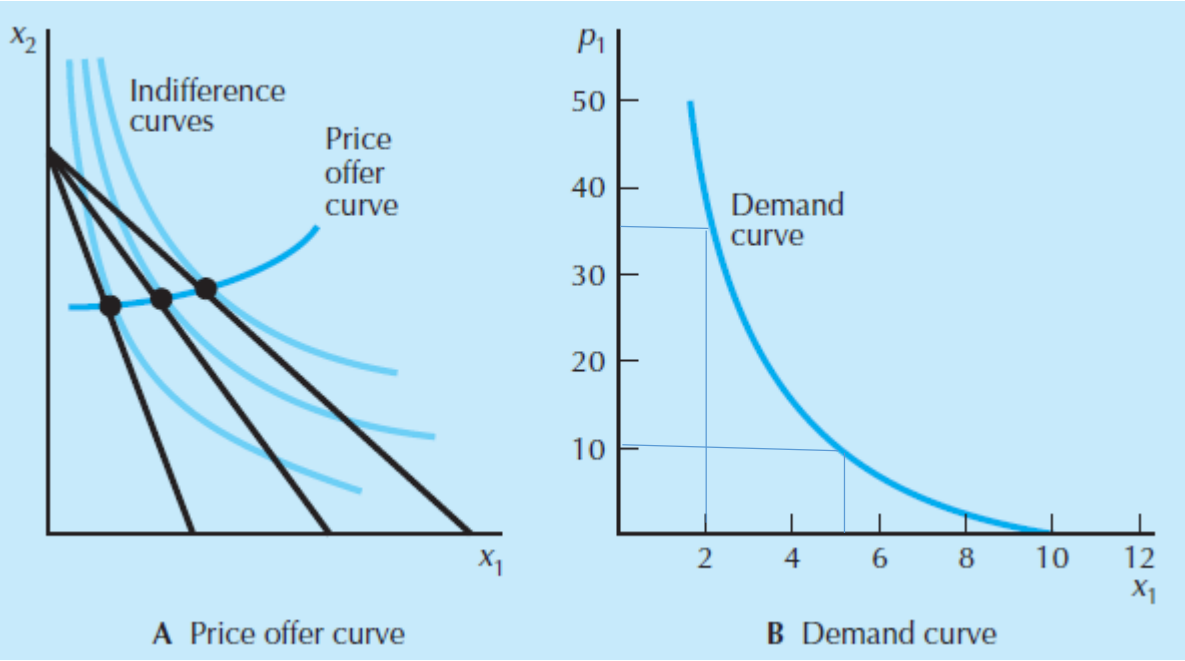


Fig. 3

Decomposition of Price Effect (Varian Ch 8):

When the price of a good changes, there are two sorts of effects: the rate at which you can exchange one good for another changes, and the total purchasing power of your income is also altered. If, for example, good 1 becomes cheaper, it means that you have to give up less of good 2 to purchase good 1. The change in the price of good 1 has changed the rate at which the market allows you to "substitute" good 2 for good 1. The trade-off between the two goods that the market presents the consumer has changed. At the same time, if good 1 becomes cheaper it means that **your money income will buy more of good 1**. The purchasing power of your money has gone up; although the number of dollars you have is the same, the amount that they will buy has increased.

The first part—the change in demand due to the change in the rate of exchange between the two goods—is called the substitution effect (SE). The second effect—the change in demand due to having more purchasing power—is called the income effect (IE).

First we will let the relative prices change and adjust money income so as to hold utility constant (consumer is on same indifference curve). This decomposition is only a hypothetical construction—the consumer simply observes a change in price and chooses a new bundle of goods in response. This is the substitutions effect (movement from X to Y, figure 4).

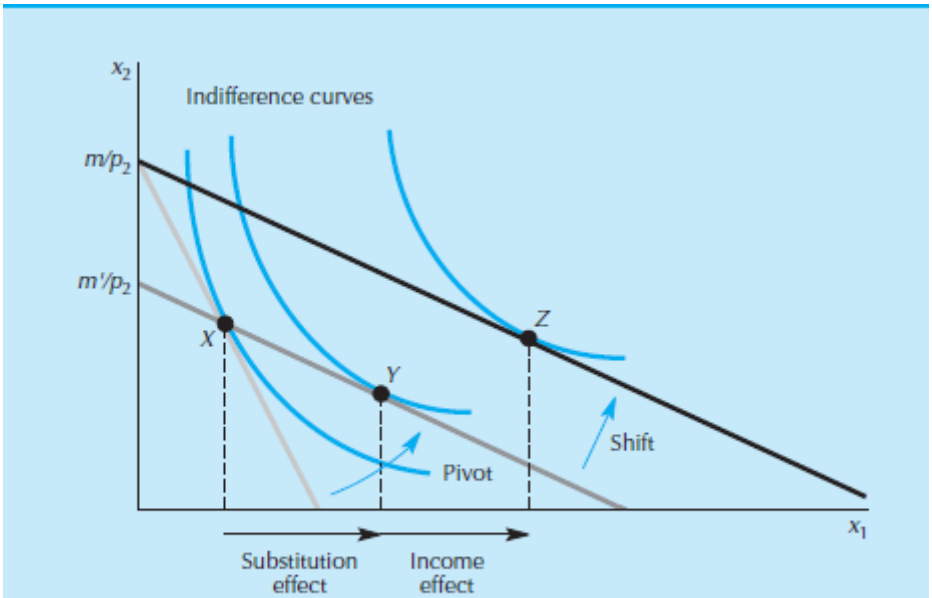
Then, we will let purchasing power adjust while holding the relative prices constant at new levels, so that consumer can move to a higher indifference curve (movement from Y to Z).

First pivot the budget line around the original demanded bundle (SE) and then shift the pivoted line out to the new demanded bundle (IE). While the substitution effect must always be negative—opposite the change in the price—the income effect can go either way. Thus the total price effect may be positive or negative.

When both SE and IE change the quantity demanded in same direction, i.e. both increase the quantity demanded, then they reinforce each other. If we have a normal good, then the substitution effect and the income effect work in the same direction. An increase in price means that demand will go down due to the substitution effect. If the price goes up, it is like a decrease in income, which, for a normal good, means a decrease in demand. Both effects reinforce each other.

PE = SE + IE

(- ve) (- ve) (- ve)



Substitution effect and income effect. The pivot gives the substitution effect, and the shift gives the income effect.

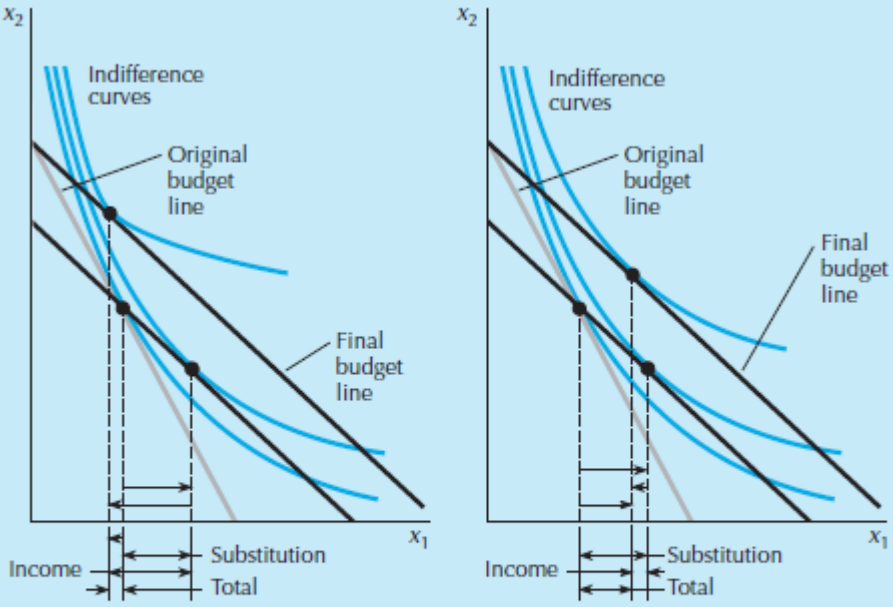
Fig. 4

When both SE and IE change the quantity demanded in opposite directions, i.e. one increases the quantity demanded, the other effect decreases the quantity demanded, then they cancel each other. If we have an inferior good, the income effect and substitution effect work in opposite directions. If price is decreased, quantity demanded rises along the same indifference curve (utility level) but as real income is increased, quantity demanded falls.

Sometimes, income effect outweighs the substitution effect, so that the total change in demand associated with a price increase is actually positive. Such a good is called a Giffen good.

At other times, it is lesser than the substitutions effect, so that price effect is still negative.

IE > SE	PE	=	SE	+	IE
	(+ ve)		(- ve)		(+ ve)
IE < SE	PE	=	SE	+	IE
	(- ve)		(- ve)		(+ ve)



A The Giffen case

B Non-Giffen inferior good

Inferior goods. Panel A shows a good that is inferior enough to cause the Giffen case. Panel B shows a good that is inferior, but the effect is not strong enough to create a Giffen good.

Fig. 5