5.17: Tax Incidence

Learning Objectives

- Explain how the price elasticities of demand and supply determine the incidence of a tax on buyers and sellers

Elasticity and Tax Incidence

People often assume that when government imposes a tax on purchases of some product, producers simply raise the price of the product so that consumers end up paying the tax. Makes sense, right? Except like many economic myths, it's not true. The analysis, or manner, of how a tax burden is divided between consumers and producers is called **tax incidence**. Tax incidence depends on the price elasticities of supply and demand.

The example of cigarette taxes introduced previously demonstrated that because demand is inelastic, taxes are not effective at reducing the equilibrium quantity of smoking, and they mainly pass along to consumers in the form of higher prices. With other products, however, the burden of the tax can be very different. Let's drill down into these ideas.

Watch It

A link to an interactive elements can be found at the bottom of this page.

Typically, the tax incidence, or burden, falls both on the consumers and producers of the taxed good. However, if one wants to predict which group will bear most of the burden, all one needs to do is examine the elasticity of demand and supply. In the tobacco example, the tax burden falls on the most inelastic side of the market.

Note also, that when taxes on sales affect the equilibrium quantity, there are effects on economic welfare. You can see that as reductions in consumer surplus, reductions in producer surplus and deadweight loss. The size of these changes depends on the price elasticities of demand and supply.

Let's consider another example. Imagine a $1 tax on every barrel of apples that an apple farmer produces. If the product (apples) is price inelastic to the consumer then the farmer is able to pass the entire tax on to consumers of apples by raising the price by $1. In this situation, consumers bear the entire burden of the tax, or the tax incidence falls on consumers. On the other hand, if the apple farmer is unable to raise prices because the product is price elastic, the farmer has to bear the burden of the tax through decreased revenues, therefore the tax incidence falls on the farmer. If the apple farmer can raise prices by an amount less than $1, then consumers and the farmer are sharing the tax burden. If demand is more inelastic than supply, consumers bear most of the tax burden, and if supply is more inelastic than demand, sellers bear most of the tax burden.

The intuition for this is simple. When the demand is inelastic, consumers are not very responsive to price changes, and the quantity demanded reduces only modestly when the tax is introduced. In the case of smoking, the demand is inelastic because consumers are addicted to the product. The government can then pass the tax burden along to consumers in the form of higher prices, without much of a decline in the equilibrium quantity.

Similarly, when a government introduces a tax in a market with an inelastic supply, such as, for example, beachfront hotels, and sellers have no alternative than to accept lower prices for their business, taxes do not greatly affect the equilibrium quantity. The tax burden now passes on to the sellers. If the supply was elastic and sellers had the possibility of reorganizing their businesses to avoid supplying the taxed good, the tax burden on the sellers would be much smaller. The tax would result in a much lower quantity sold instead of lower prices received. Figure 1 illustrates this relationship between the tax incidence and elasticity of demand and supply.

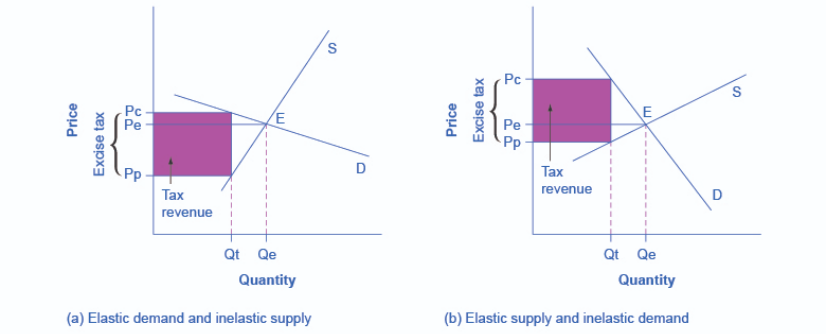

Figure 1. An excise tax introduces a wedge between the price paid by consumers (Pc) and the price received by producers (Pp). The vertical distance between Pc and Pp is the amount of the tax per unit. Pe is the equilibrium price prior to introduction of the tax. (a) When the demand is more elastic than supply, the tax incidence on consumers Pc – Pe is lower than the tax incidence on producers Pe – Pp. (b) When the supply is more elastic than demand, the tax incidence on consumers Pc – Pe is larger than the tax incidence on producers Pe – Pp. The more elastic the demand and supply curves, the lower the tax revenue.

In Figure 1(a), the supply is inelastic and the demand is elastic, such as in the example of beachfront hotels. While consumers may have other vacation choices, sellers can't easily move their businesses. By introducing a tax, the government essentially creates a wedge between the price paid by consumers Pc and the price received by producers Pp. In other words, of the total price paid by consumers, part is retained by the sellers and part is paid to the government in the form of a tax. The distance between Pc and Pp is the tax rate. The new market price is Pc, but sellers receive only Pp

per unit sold, as they pay Pc-Pp to the government. Since we can view a tax as raising the costs of production, this could also be represented by a leftward shift of the supply curve, where the new supply curve would intercept the demand at the new quantity Qt. For simplicity, Figure 1 omits the shift in the supply curve.

The tax revenue is given by the shaded area, which we obtain by multiplying the tax per unit by the total quantity sold Qt. The tax incidence on the consumers is given by the difference between the price paid Pc and the initial equilibrium price Pe. The tax incidence on the sellers is given by the difference between the initial equilibrium price Pe and the price they receive after the tax is introduced Pp. In Figure 1(a), the tax burden falls disproportionately on the sellers, and a larger proportion of the tax revenue (the shaded area) is due to the resulting lower price received by the sellers than by the resulting higher prices paid by the buyers. Figure 1(b) describes the example of the tobacco excise tax where the supply is more elastic than demand. The tax incidence now falls disproportionately on consumers, as shown by the large difference between the price they pay, Pc, and the initial equilibrium price, Pe. Sellers receive a lower price than before the tax, but this difference is much smaller than the change in consumers' price. From this analysis one can also predict whether a tax is likely to create a large revenue or not. The more elastic the demand curve, the more likely that consumers will reduce quantity instead of paying higher prices. The more elastic the supply curve, the more likely that sellers will reduce the quantity sold, instead of taking lower prices. In a market where both the demand and supply are very elastic, the imposition of an excise tax generates low revenue.

Some believe that excise taxes hurt mainly the specific industries they target. For example, the medical device excise tax, in effect since 2013, has been controversial for it can delay industry profitability and therefore hamper start-ups and medical innovation. However, whether the tax burden falls mostly on the medical device industry or on the patients depends simply on the elasticity of demand and supply.

Try It

https://assessments.lumenlearning.co...sessments/7173
https://assessments.lumenlearning.co...sessments/7174

Learning Objectives

[glossary-page][glossary-term]tax incidence: [/glossary-term]
[glossary-definition]distribution of the tax burden between buyers and sellers[/glossary-definition][/glossary-page]

Contributors and Attributions