Incidence and Distribution

Theory of Tax Incidence

There are four principles in the analysis of tax incidence:

1. The entire burden of a tax must be traced to individuals. Businesses may remit taxes, but only individuals–shareholders, employees, customers–can bear the burden of taxes.
2. The ultimate distribution of the tax burden may differ from the statutory liability; that is, the tax burden may be shifted because prices change.
3. The long run effect of taxes does not usually depend on which side of the market the statutory liability is placed.
4. The better the alternatives one has to the taxed good or activity, the less likely one is to bear the burden of the tax.

Our analysis so far has assumed a single homogenous type of labor and a fixed pre-tax wage. If there are two types of labor, skilled and unskilled, increasing the tax on skilled labor may decreased the supply of that labor, thereby increasing the pre-tax wage. Similarly, a tax on capital income may encourage capital flight, decreasing productivity and the wage rate in the taxing country. Simple models also assume that the only thing consumers sell is their labor, ignoring the fact that while an increase in the price of a good makes those who buy it worse off, it also makes those who produce it better off.

The incidence of a tax may shift because the tax causes prices to change in the taxed market or in other markets. A tax on yachts will increase the price of yachts, causing fewer yachts to be bought. The new, after-tax price is not necessarily equal to the old price, so that the burden of the tax falls not just on those who buy yachts, but also those who produce them. A tax on butter will cause substitution toward margarine, driving up the price of margarine. Margarine buyers are worse off and margarine producers are better off even though the tax was imposed in a different market.

Statutory liability can affect incidence in some situations. Statutory liability can also affect the efficiency of the tax system. Employers may have an advantage in record-keeping because of economies of scale, so having employers remit the taxes means a lower cost for collecting given revenue. If evasion opportunities differ based on who remits the taxes, changes in statutory liability can affect incidence. With noncompetitive behavior, ad valorem and unit taxes do not have the same effect. Ad valorem taxes lower prices and increase quantity more than unit taxes.

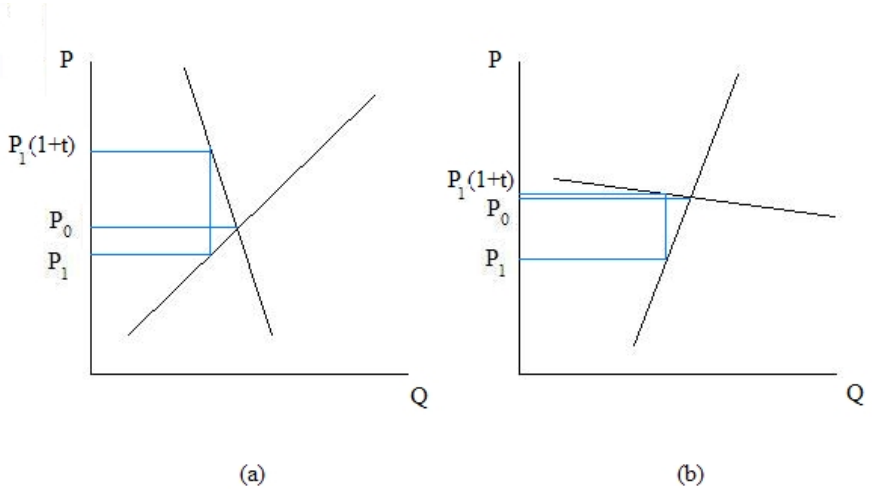


Figure 19

Long run incidence may vary because of long run variations in the elasticity of supply and demand. In Figure 19a, the consumer price rises considerably, while there is little change to the producer price. The consumer has no good alternative to the taxed good (i.e., demand is relatively inelastic) so the consumer bears the majority of the burden of the tax. Contrast this with Figure 19b, where there is elastic demand and inelastic supply. In this case, the consumer price rises relatively little, while the producer price falls more, so the producer bears most of the burden of the tax. Consider as a concrete example how the incidence of a tax varies when comparing a tax on food, hamburgers, and McDonald's hamburgers. The demand for food is relatively inelastic, so the burden of such a tax will fall mainly on consumers. The demand for hamburgers is much more elastic since people can switch to hot dogs or other substitutes; a tax in this market will not have much effect on the consumer price. The demand for McDonald's hamburgers, if Burger King's are a perfect substitute, is fully elastic; the burden of a tax will be borne by the producer. As a general rule, for one market, the ratio of supply and demand elasticities will determine the incidence of a tax.

Note that incidence analysis does not require using the compensated demand curve, because it addresses the question of who bears the entire burden of a tax, not just the excess burden.

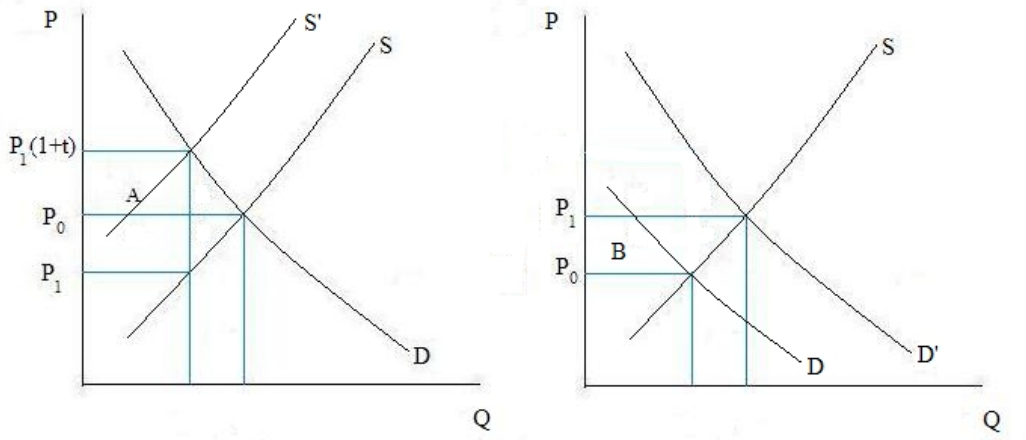
We can analyze the labor market just as we would the market for any other commodity. Labor supply is determined by an individual's preferences between labor and leisure. Labor demand depends on technology and the ability to substitute between capital and labor. If there is high substitutability between

capital and labor, labor demand will be very elastic and workers will bear most of the burden of a tax in the form of a lower after-tax wage. If labor supply is very inelastic, workers will also bear the burden of a tax. If a tax was imposed just on those who work at McDonald's, the high elasticity of labor supply for this one employer implies that McDonald's will have to pay higher pre-tax wages. Workers at McDonald's will not bear the burden; to discover the incidence of the tax we would have to trace its effects through the corporation, to shareholders or customers. When there is more than one type of labor, the incidence of a tax on one type will depend on the substitutability between the two types.

Empirically, studies show that the uncompensated elasticity of labor supply is very small or zero for the core labor force. Those with low labor force attachment, such as teenagers, married women, and the nearly retired, have a higher elasticity. If there are responses to the income tax not on the labor/leisure margin, labor supply elasticity is less important for incidence than the elasticity of total taxable income. However, if we are concerned with the effect of taxes on the wage rate, the labor supply elasticity is still relevant.

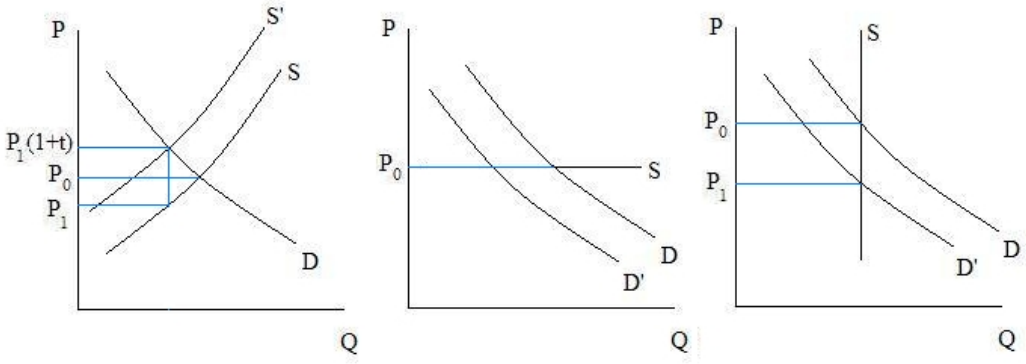
As mentioned briefly above, a tax on one good may affect the markets for other goods as well. Thus, we need to consider incidence in general equilibrium, particularly when very close substitutes to a taxed good exist. A tax on butter will raise the consumer price and reduce the producer price of butter. In Figure 20a, this is shown as a reduction in the supply of butter. (It could also be represented as a decrease in demand). Given the assumptions about elasticities implied by the slope of the curves, there are declines in both consumer and producer surplus; both bear some of the burden of the tax. The rise in the consumer price of butter will cause some consumers to switch to margarine, which is a shift out in the demand curve in Figure 20b. Area B in this figure is also a change in consumer surplus. The effects of the tax in this market, however, are zero-sum. The fall in consumer surplus for purchasers of margarine is exactly offset by the rise in producer surplus for those who sell that margarine. The tax does not create a wedge of deadweight loss in this market; it simply redistributes surplus. The full burden of the tax, both the revenue raised and the deadweight loss, can be measured in the primary market for butter.

A full general equilibrium analysis will look at the burden that falls on producers and trace it back to the individuals that actually bear that burden by analyzing the markets for factor inputs. To consider who bears the burden of a tax on wine, for example, we will have to look at what happens to wine drinkers, vineyard owners, and vineyard employees. Figure 21 shows three markets, for wine, vineyard employees, and vineyard land. Drawing conclusions about incidence will require making some assumptions about the structure of these markets. As drawn, the market for wine has standard demand and supply curves. Since vineyard employees can move to other industries, at least in the long run, the supply of workers is flat. If we assume that vineyards can only be used in producing grapes, the supply of land for grapes will be vertical.



(a) Butter (b) Margarine

Figure 20



(a) Wine (b) Vineyard Labor (c) Vineyards

Figure 21

What are the effects of a tax on wine? The price of wine will rise, decreasing the amount of wine supplied (shown in Figure 21a as a shift back of the supply curve). Since less wine is being produced, the demand for workers and land in this industry falls. Because the supply of workers is perfectly elastic, this has no effect on wages. The supply of land is fixed, so the fall in demand for vineyard acreage causes a fall in the price of vineyards. Thus, under these assumptions, the producer's share of the burden is borne entirely by vineyard owners.

General equilibrium analysis must also consider the effects of a tax on secondhand markets. A tax on new yachts will affect people who buy yachts, people who build them, people who own boat construction facilities, and everyone in the market for secondhand yachts. A increased tax on new yachts will increase the demand for secondhand yachts, but since the supply of pre-owned yachts is fixed, surplus is transferred to those who already own yachts from consumers in the market for a used yacht.

Tax Revenue vs. Tax Burden

When a new tax is imposed in a market, the tax revenue is a "first order" burden, while the deadweight loss is a "second order" effect. The idea is that when a tax moves from zero to something not too far from zero, the size of the deadweight loss is small compared to the revenue generated. Graphically, this is very intuitive; the deadweight loss triangle is small compared to the revenue area. However, the additional excess burden of a tax is no longer second order when raising a tax that already exists in the market. In Figure 22, the additional revenue from raising the tax is the area C + D - E. Note that when a tax is initially imposed, the additional revenue includes no negative term. The loss in consumer surplus is C + F, while the loss in producer surplus is D + G. The excess burden due to the tax increase is thus (C + F) + (D + G) - (C + D - E) = F + G + E. Graphically, the additional deadweight loss is a trapezoid rather than a triangle, so that the excess burden is now a larger share of the total burden. In fact, at the top of the Laffer curve, the excess burden can be 100% of the total burden, and past that point, deadweight loss is so large relative to revenue that increases in the tax rate are net revenue losers.

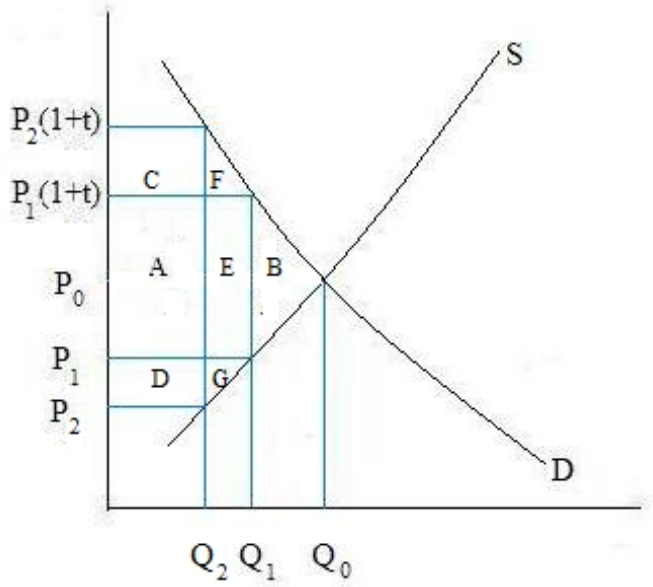


Figure 22

Lifetime vs. Annual Measures

Incidence calculations that do not take into account life-cycle implications can be very misleading. For example, the Social Security tax is capped so that it applies roughly only to the first $80,000 of income. The average tax rate falls with income, so based purely on this measure, the tax is regressive. However, Social Security benefits are generally very progressive, and workers and retirees are not two distinct groups of people. They are the same people moving through the tax system at different times of life. Once this is accounted for, Social Security looks somewhat progressive over the whole lifetime.