CHAPTER 11: MAKING PREDICTIONS USING ECONOMIC THEORY

The role of economic theory in policy analysis

Economic theory is a useful tool for conducting policy analysis. In some cases, we can make predictions using theory and a little knowledge about the real world. In other cases, economic theory is a useful framework around which to build a policy analysis. This chapter presents three cases illustrating the use of theory.

Case 1: Banning direct-to-consumer advertising

Sometimes economic theory is helpful for making predictions. Economic theory might not give a precise prediction, but it can help rule out illogical predictions. Consider the following statements about direct-to-consumer pharmaceutical advertising.

> Almost every country in the industrialized world bans or severely restricts direct-to-consumer advertising because it increases prescription drug costs…1

> In fact, it would seem that the spending drug companies need to recoup with higher prices is at least partly due to how much is spent on direct-to-consumer advertising.2

The claim is that prohibiting direct-to-consumer pharmaceutical advertising would cause drug prices to fall. We can assess the claim using the economic model for monopoly pricing.

If you write down a function describing monopoly profits, take the derivative with respect to price, and do a bit of re-arranging, you get something called the Lerner Index

$$\frac{p-c}{p} = -\frac{1}{\varepsilon},$$

The left-hand side is the profit margin (price minus cost divided by price). The right hand side is one divided by the price elasticity. The profit maximizing price satisfies this expression. It shows that the profit margin is higher in markets where the price elasticity is lower.

You can re-arrange the expression to get:

$$p = \frac{1}{1+\frac{1}{\varepsilon}}c\,.$$

[1] Hillary's Plan to Respond to Unjustified Price Hikes for Long-Available Drugs. September 2, 2016. https://www.hillaryclinton.com (Accessed June 16, 2017).
[2] Consumer Reports. Is There a Cure for High Drug Prices? July 29, 2016 http://www.consumerreports.org/drugs/cure-for-high-drug-prices/ (Accessed June 16, 2017).

The price elasticity of demand for specialty drugs is 0.01-0.21.[3,4] Let's plug in 0.1.

$$p = \frac{1}{\left(1+\frac{1}{0.1}\right)} MC$$
$$= 0.09MC$$

This implies that if costs fall by $1.00, prices will fall by only $0.09. The theory is not consistent with the claim that that prohibiting direct-to-consumer advertising will have a substantial impact on consumer prices.

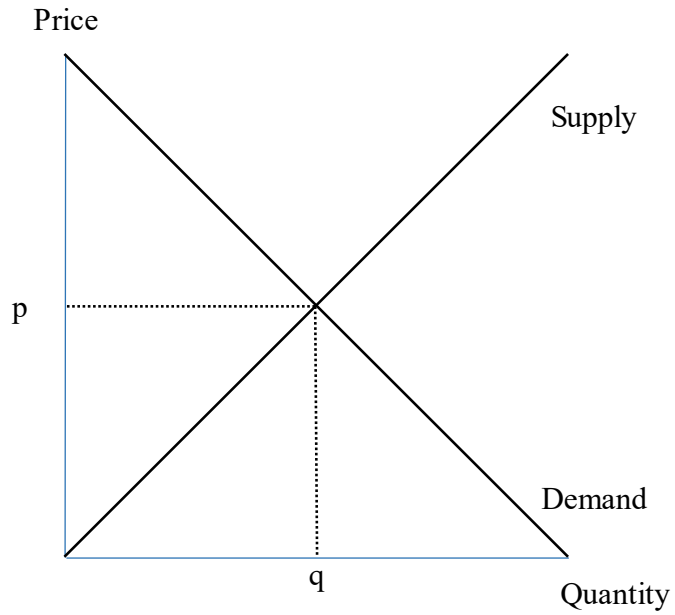
Using this framework, you can investigate more complex models: What if advertising is a fixed cost (instead of a marginal cost)? What if advertising makes demand less elastic? What if it expands the size of the market? A simple analysis like this will not provide a definitive answer, but it can help you think about what matters and reject, out-of-hand, the simple notion that there is a dollar-for-dollar tradeoff between prices and advertising expenditures.

Case 2: A cigarette tax

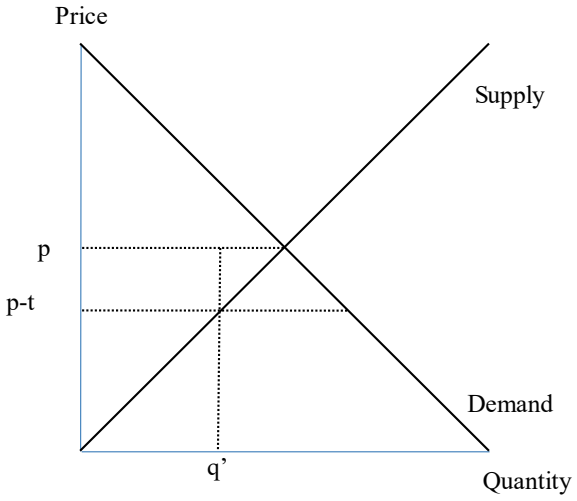
Suppose a state is considering increasing the tax on cigarettes. Stores are responsible for paying the tax. We can use economic theory to assess the claim: "Increasing the tax will have no impact on smoking rates because stores, not consumers, are responsible for paying it." Initially, we have a market in equilibrium.

[3] Goldman DP, Joyce GF, Lawless G, Crown WH, Willey V. Benefit design and specialty drug use. Health Affairs 2006;25(5):1319-31.

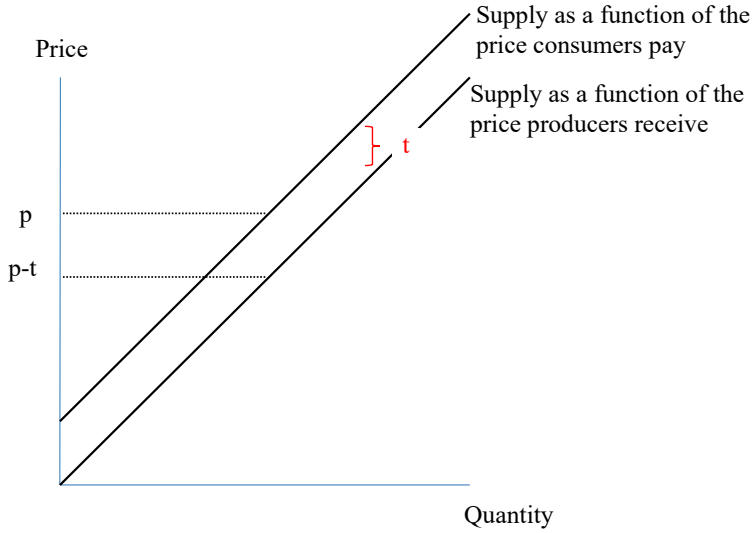
[4] One caveat: Monopolists should always price in the elastic part of the demand curve. That the price elasticity is so low suggests that drug firms are not fully exploiting their power to raise prices, at least in the market for specialty drugs.



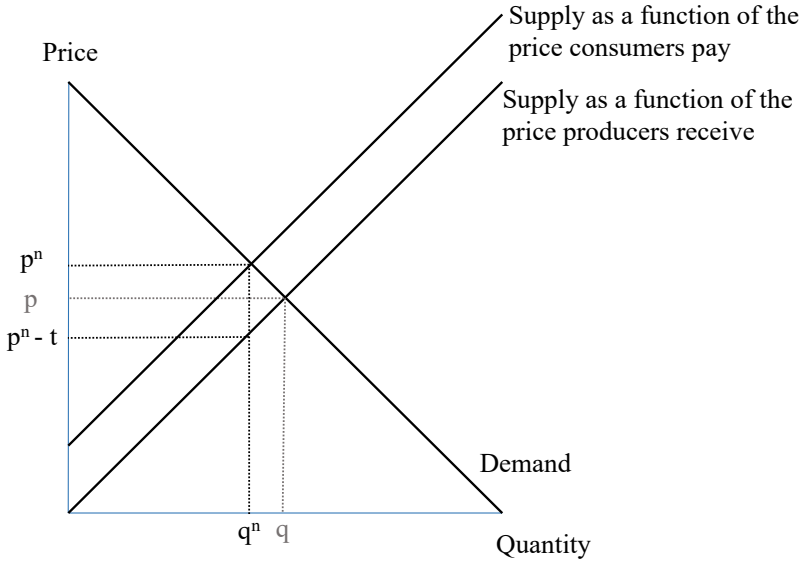
If the government imposes a tax on producers of t for every unit sold, then producers will receive p – t. Suppose for a minute that producers pay the entire tax. They would be willing to supply q' units at that price, but consumers would still demand q units at the old price. There would be a shortage. That would lead producers to raise the price.



To determine the equilibrium price, it helps to draw a new supply curve that depicts the relationship between the price consumers pay and the amount producers are willing to supply. It is the old supply curve shifted up vertically by the amount of the tax.



We can now determine the new equilibrium price and quantity. The amount consumers pay increases from p to p^n and the quantity decreases to q^n. At that price and quantity combination consumers do not want to buy any more (or less), and producers do not want to supply any more (or less).



The price consumers pay increases from p to p^n. The price producers receive decreases from p to p^n-t.

Mandated benefits

Economic theory suggests that there is a one-to-one tradeoff between wages and fringe benefits. The market price of labor reflects total compensation, inclusive of wages and fringe benefits. A change to wages that does not alter the market price must necessarily cause an adjustment in fringe benefits (and vice versa) to keep the labor market in equilibrium. A new mandated benefit will be accompanied by a reduction in wages, which is important to account for in policy analyses that assess the impact of benefits on individual welfare and employers' costs.

Prior to the mid 1970s, most insurance plans did not cover maternity benefits (pregnancy care and delivery). In the second half of the 1970s a number of states required plans to cover maternity benefits. (The 1978 Pregnancy Discrimination Act mandated coverage of maternity benefits nationwide.)

Gruber (1994) studied the impact of the mandates on women's wages and employment. The table below reports data from Table 3 in Gruber's paper, minus the standard errors. The outcome is the log of wages. The difference in log wages is the percent change in wages.

Table 3 from Gruber (1994). The incidence of mandated maternity benefits

	Pre	Post	Difference
	ln(wages)		
Married women, 20-40 years old			
Treated states	1.547	1.513	-0.034
Control states	1.369	1.397	0.028
Difference-in-difference			-0.062
Women over 40, single males 20-40			
Treated states	1.759	1.748	-0.011
Control states	1.630	1.627	-0.003
Difference-in-difference			-0.008
Difference-in-difference-in-difference			-0.054

Wages declined by 3.4% among women of childbearing age in states that required insurers to cover maternity benefits. Wages increased by 2.8% in control states. The difference-in-difference estimate is -6.2%, which indicates that requiring insurers to cover maternity benefits caused the wages of women ages 20-40 to decline by 6.2%.

But wait! There is another control group: women over 40 and single males ages 20-40 in treatment states. So we have a difference-in-difference-in-difference analysis. In the treated states, wages in this group declined, but by only 1.1% compared to 3.4% among women ages 20-40. The difference-in-difference-in-difference estimate (call it the "triple diff" if you want to sound in-the-know) is -5.4% [= -6.2 – (-5.4)].

Gruber finds that there was no change in employment or hours worked. The implication is that women valued the new benefit, and were willing to accept a dollar-for-dollar reduction in wages.

If they valued the benefit at less than the full cost, then it is more like a tax, and we would expect there to be reductions in labor supply.