

## Economics Slides

<http://cba.unomaha.edu/faculty/mohara/web/BLFf10-Econ-Slides.pdf>

### NON-PRICE DETERMINANTS OF

#### SUPPLY

# & size of sellers  
horizontally sum

costs for inputs

prices of related goods  
substitutes (A or B)  
compliments (A and B)

taxes

technology

expectations

#### DEMAND

# & size of buyers  
horizontally sum

income

prices of related goods  
substitutes (A or B)  
compliments (A and B)

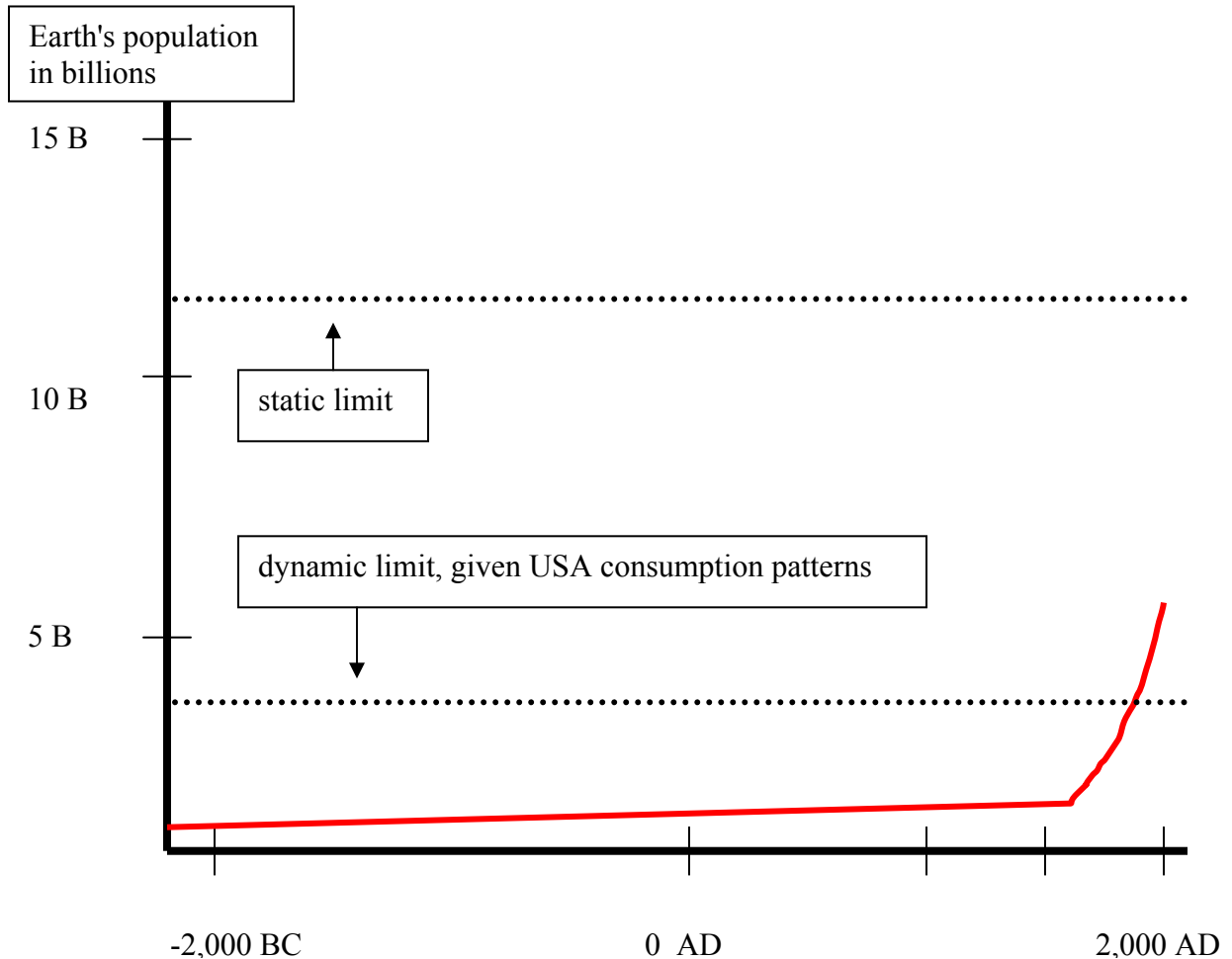
tastes

expectations

**Expectations are volatile**  
**(i.e., capable of fast and large changes).**  
**Technology is dynamic (i.e., volatile network effect).**

<b>ELEMENTS (means)</b>	<b>CAPITALISM</b>	<b>FUNCTIONS (ends)</b>
<b>private property</b>	<b>and</b>	<b>embody self interest</b> makes your subj. objective
<b>prices</b>		<b>measure self interest</b> voluntary
<b>markets</b>		<b>coordinate self interest</b> knowing (i.e., information)
<b>competition</b>		<b>regulate self interest</b> alternatives = voluntary
<ul style="list-style-type: none"> <li>1. free entry &amp; free exit</li> <li>2. "large" number of buyers &amp; sellers</li> </ul>		
 <b>AND</b> 		
<b>government</b>		<b>facilitates p.p., p., m., &amp; c.</b>
		<ul style="list-style-type: none"> <li>1. <b>define rights</b> <ul style="list-style-type: none"> <li>a. <b>private property</b></li> <li>b. <b>contracts</b></li> <li>c. <b>torts</b></li> <li>d. <b>crime</b></li> </ul> </li> <li>2. <b>set transaction costs</b></li> </ul>

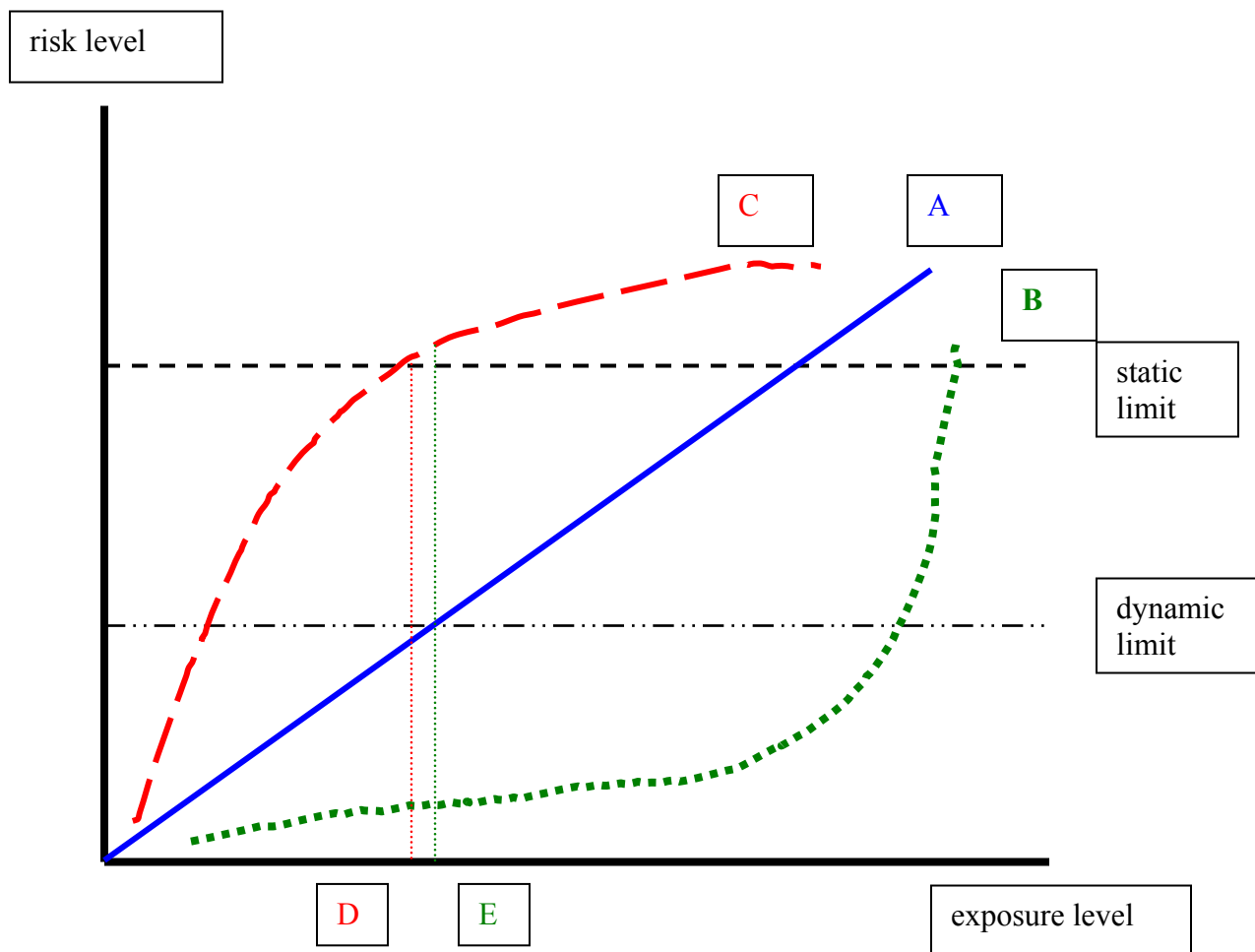
**Figure 1: World Population**



No human born before 1920 lived long enough to witness Earth's population double. Every human born before 1960 and alive today has witnessed Earth's population at least triple. The human population explosion was triggered by steam engine and the Industrial Revolution, circa 1850. This has generated a **difference in degree** that is a **difference in kind** of both the **quantity and quality** of human pollution.

There are widely varied estimates of the Earth's static limits. Generically, the more intensive the consumption patterns, the lower the maximum feasible sustainable population. If all humans lived like those in the USA, then the static limit is thought to be around 4 billion. Today, the Earth's population is over 6 billion. However, if all humans were vegetarians, then the static limit is thought to be around 12 billion. In what year will we reach 12 billion? Is this an instance when you can use the Rule of 72?

**Figure 2: Unpredictable Consequences**



This Figure is a very gross over simplification. For example, there would not be this clear of a consensus on where the dynamic or the static limits were, and both would be seen as vacillating bandwidths rather than lines. That said, this Figure helps us to see the issues.

Line A is what the government's administrative agencies tend to do (i.e., compromise).

Line B is how businesses tend to see the ecosystem's **regenerative ability** (i.e., very large, with significant risks only reached at very high exposure levels).

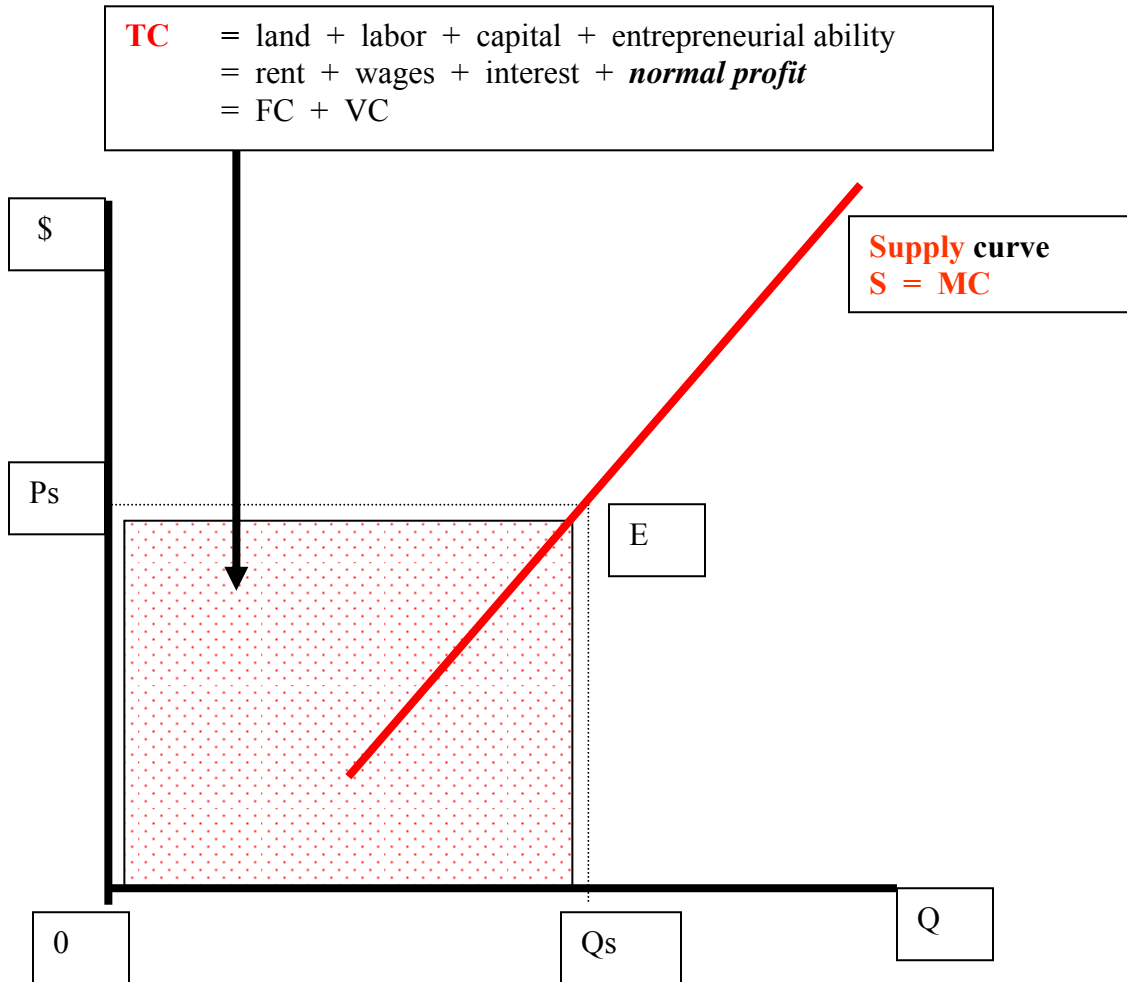
Line C is how conservations tend to see the ecosystem's regenerative ability (i.e., small, with significant risks quickly reached at low exposure levels).

If C is true,  
but lobbyists get government to adopt A, then we die at exposure D.

If B is true,  
but lobbyists get government to adopt A, then needless lost output starts at exposure E.

**With lines B and C what type of error is involved: Type I and/or Type II?**

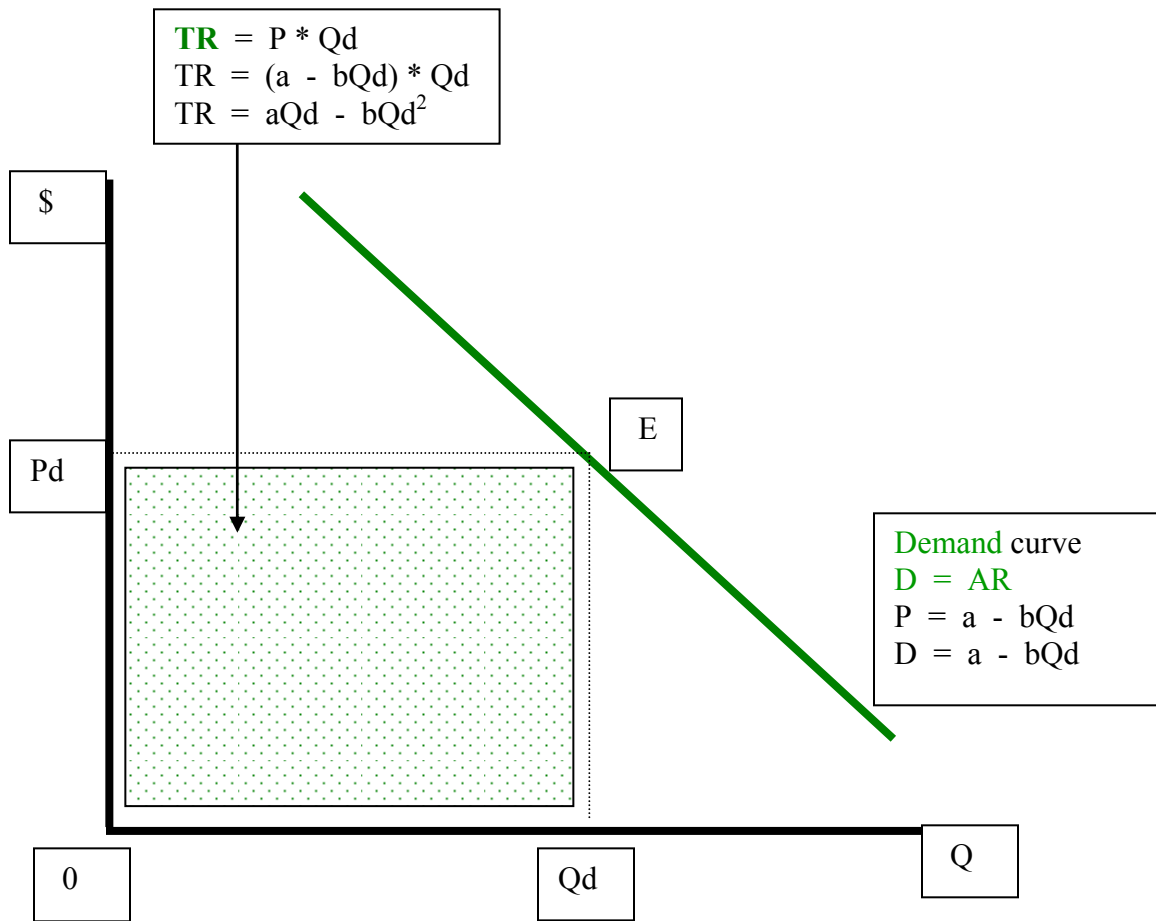
**Figure 3: Law of Supply**



The Supply Curve shows a **direct relationship** between price and quantity. As the price increases, so does quantity the sellers are **WILLING AND ABLE** to supply to the market.

With price at  $P_s$  and the quantity supplied at  $Q_s$ , the Total Cost is the area bounded by  $0P_sEQ_s$

**Figure 4: Law of Demand**

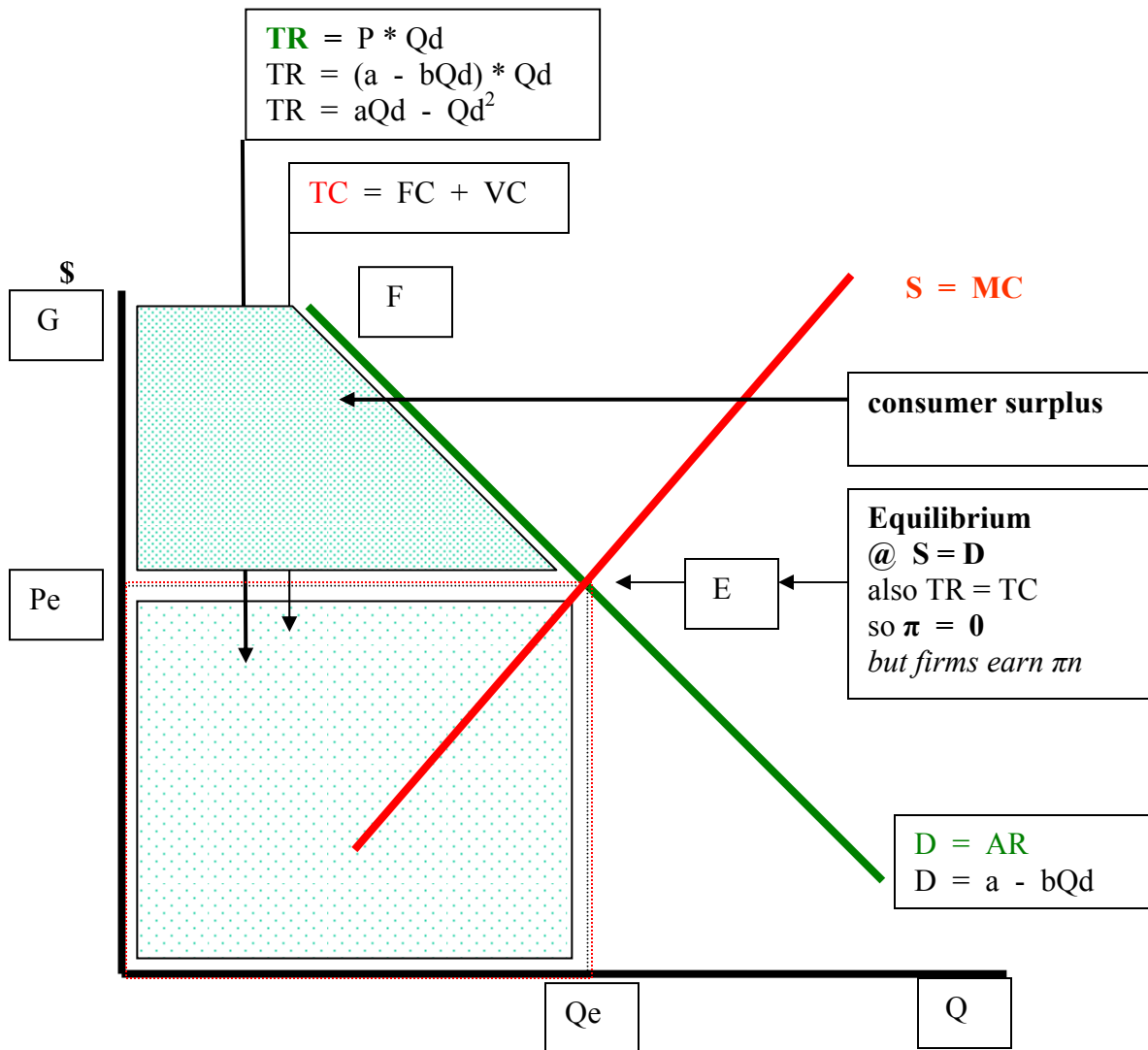


The Demand Curve shows an *inverse relationship*. Initially, at low quantities, buyers are willing to pay high prices; but, as the quantity that must be purchased increases, the price the buyers are **WILLING AND ABLE** to pay decreases. Recall, the Demand Curve shows *alternative, not sequential, purchases*.

With price at  $P_d$  and the quantity demanded at  $Q_d$ , Total Revenue (i.e.,  $P * Q_d$ ) is the area bounded by  $0P_dEQ_d$ .

For those students that know the calculus,  
 FIRST, what is the first derivative of TR with respect to  $Q_d$ ?;  
 SECOND, what is the mathematical proportion of the demand curve to the MR curve?;  
 THIRD, why do all of these graphs state  $S = MC$  (hint:  $P > AVC$ )?

**Figure 5: Equilibrium**



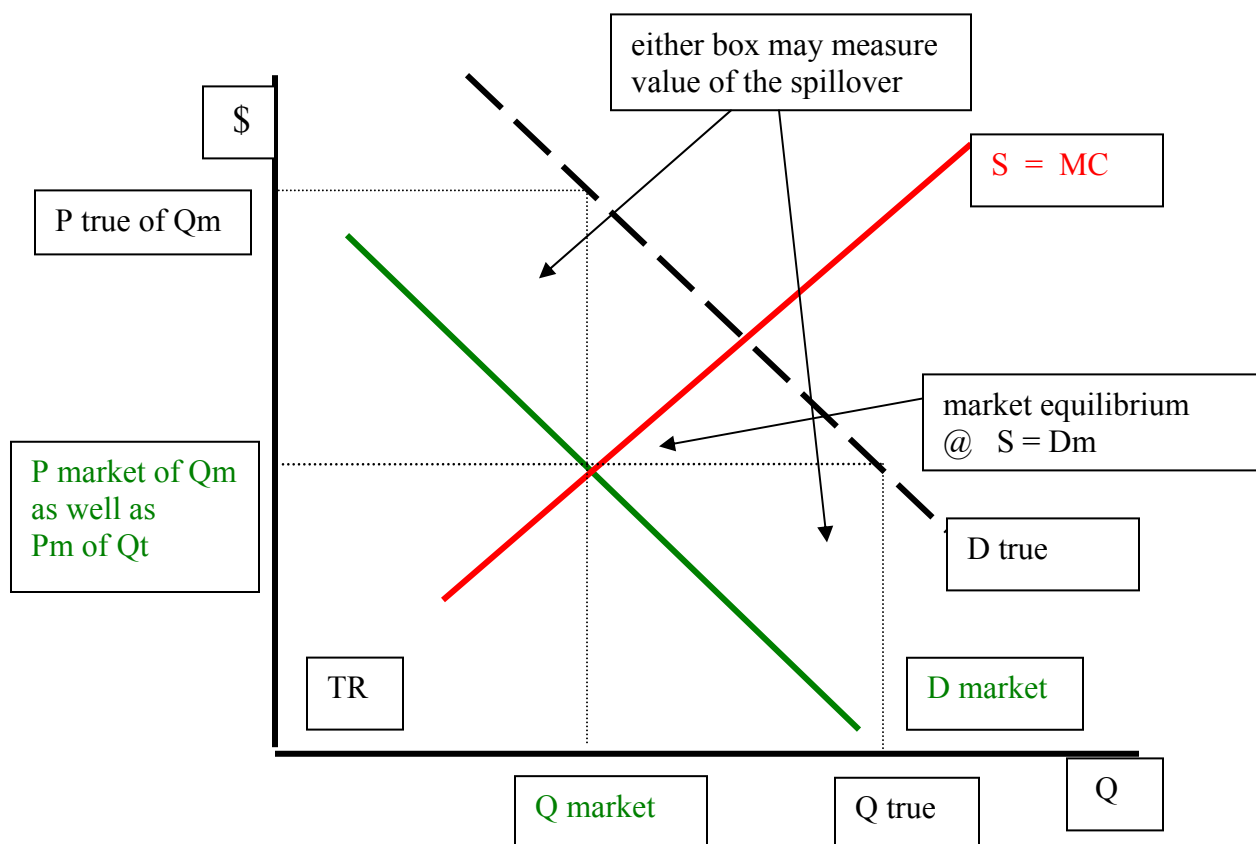
Buyers would have been both **WILLING AND ABLE** to pay prices above  $P_e$ , but, due to competitive pressures can not be forced to do so by sellers. Thus, buyers obtain the **Consumer Surplus**, the area above  $P_e$  bounded by  $P_eGFE$ . The **Producers Surplus** is not displayed, but is a mirror image of the Consumer Surplus below  $P_e$ .

Also note, the *market's profit level* (i.e.,  $\pi$ ) equals zero, **but** *firms* in the market *earn normal profit* (i.e.,  $\pi_n$ ) because  $TR = TC$ .

If the market  $P$  is above  $P_e$ , then there will be market **surplus** as sellers will be willing and able to offer more than buyers are willing and able to buy.

If market  $P$  is below  $P_e$ , then there will be a market **shortage** as sellers will be willing and able to offer less than buyers are willing and able to buy.

**Figure 6: Spillover Benefits**



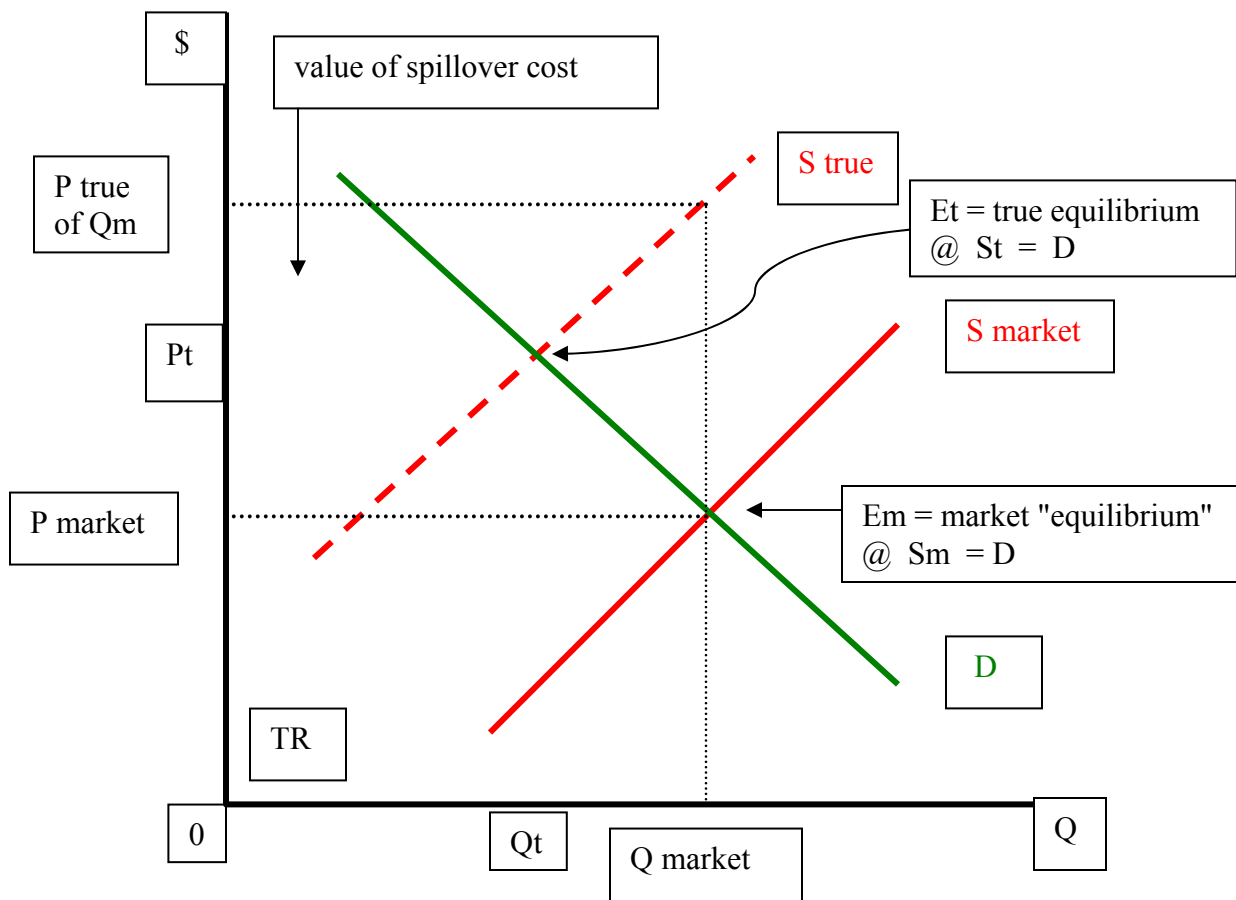
The market result is equilibrium at P market and Q market. Given this market result, there are two ways to view graphs of spillovers. Pick one and use that one repeatedly. This Figure 6 on spillover benefits shows both ways. The spillover cost curve, Figure 7, only uses # 2 (i.e., entering from the quantity axis).

# 1: start with price. Enter the graph from the price axis at P market and a spillover benefit causes too little to be purchased (i.e., Q true minus Q market).

# 2: start with quantity. Enter the graph from the quantity axis at Q market and a spillover benefit causes the price to be too low (i.e., P true minus P market).

This Figure 6 on spillover benefits shows two ways spillovers can cause value to escape being captured by the market price. That escaped value is *one of the rectangles* outside of TR (i.e., either the top left box or the bottom right box, but not both boxes).

**Figure 7: Spillover Costs**



When there are spillover costs, at the equilibrium of P market and Q market there will be excess consumption. If the market moved to an equilibrium at  $D = S \text{ true}$ , then both price would go up **and** quantity would go down. Alternatively, if the market stays at Q market, then price per unit should rise to P true.

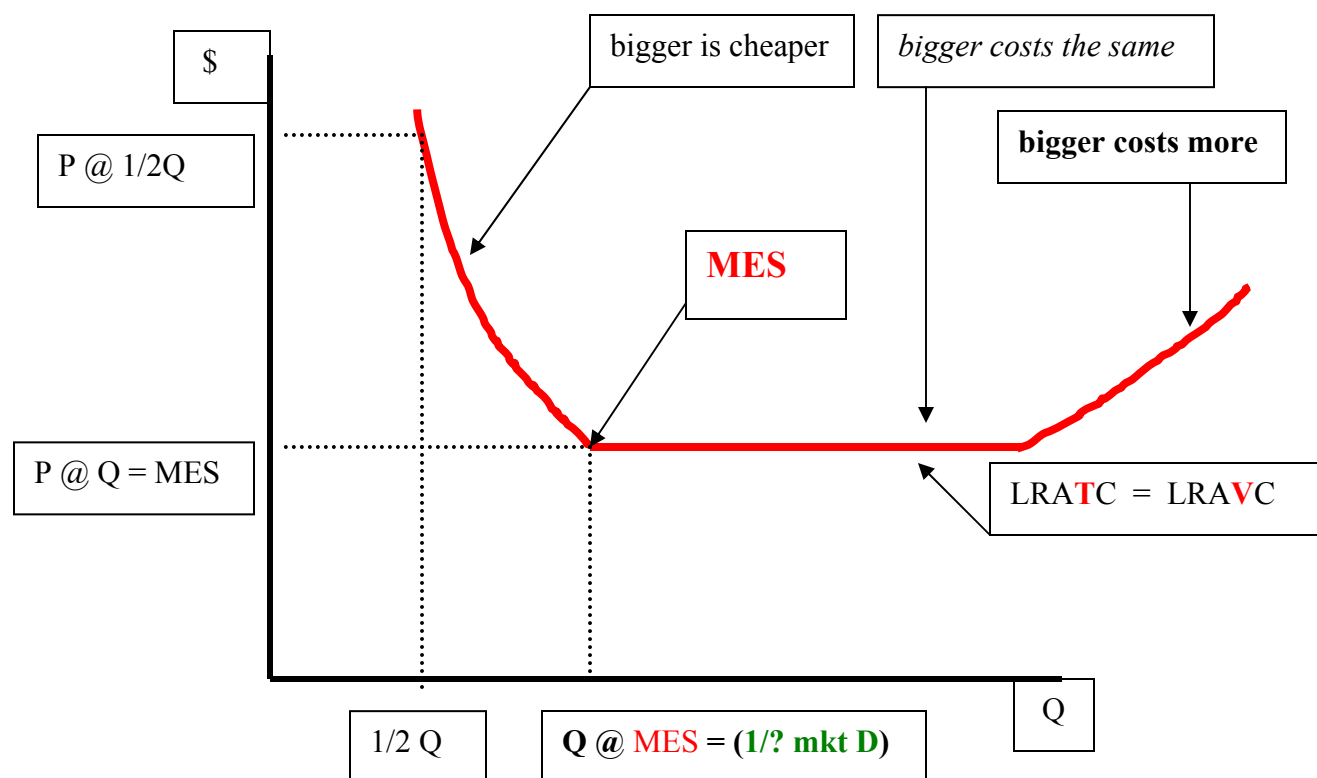
All markets always have spillover costs and spillover benefits.

Typically, these spillovers are not material to the transaction.

Thus, the real question becomes: "When a spillover is material, can government improve its facilitation of P.P., P., M., and C.?" Ordinarily, ***just because something is broken does not mean you can fix it.***

The market "equilibrium" TC is the rectangle  $0P_mE_mQ_m$ .  
The true equilibrium TC is the rectangle  $0P_tE_tQ_t$ .

**Figure 8: Minimum Efficient Size (MES)**



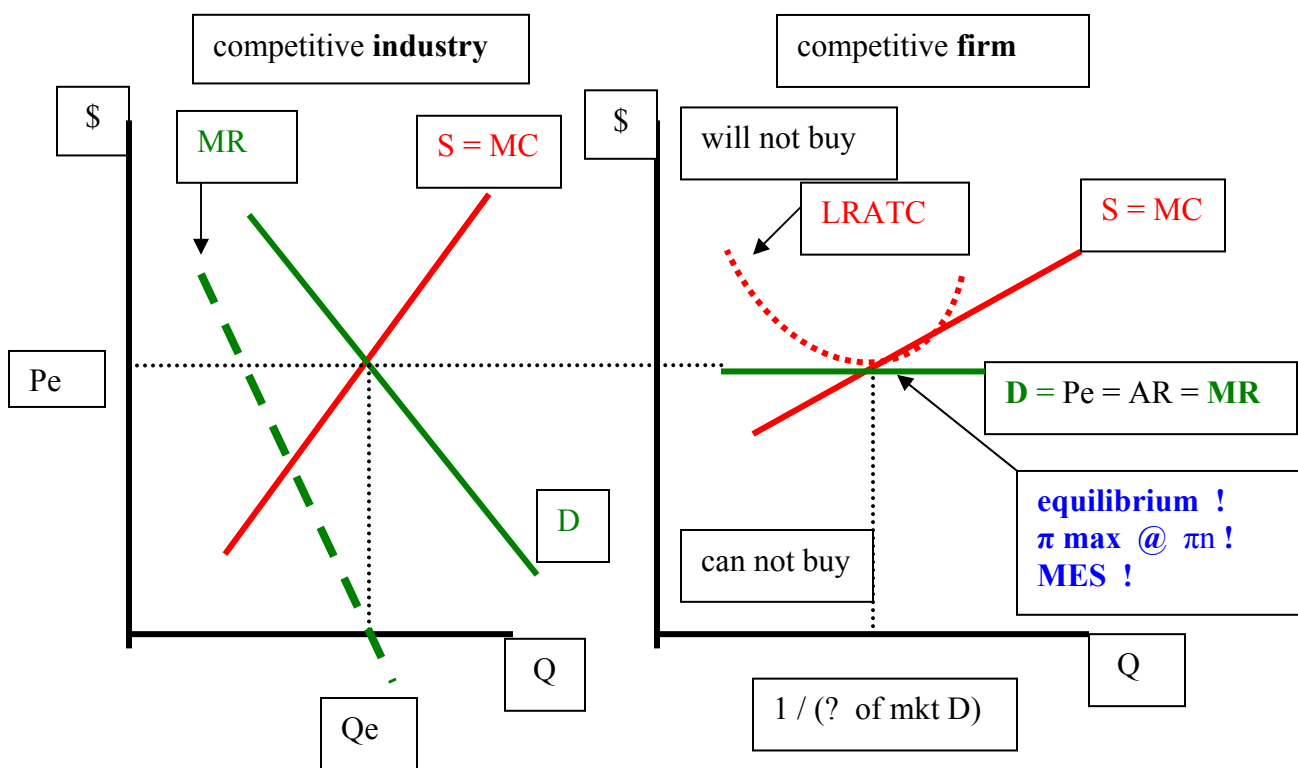
A gross **mis**interpretation of the MES curve is that all firms *must* be large to be efficient. The correct interpretation of the MES curve is that each firm must seek a size consistent with its market demand. Both Rolls Royce and Ford can continue to exist and prosper, but Ford's LRAVC will be less for the larger market demand Ford serves. RR's LRATC is higher than Ford's, but RR is serving a smaller Q, and RR's higher LRATC is better matched to its lower Q.

MES is a feature of a cost function, but MES links back to the demand. The MES sized firm is some fraction of the market demand. If that size is 1/100th, then 100 firms can fill the market, each at MES, and that market most likely will be competitive. If that size is 1/1, then the market demand calls for a **natural monopoly**. Generically, as MES requires more than 1/8th of market demand the assumption of competition is more and more suspect (e.g., 1/16th tends to be far more competitive than 1/4th).

$LRATC = LRAVC$  because in the long run  $FC = 0$ . This means that MES is not a measure of the short run. That is,  $LRAVC = LRATC$  because in the long run fixed costs are equal to zero; hence, the long run average variable costs equal the long run average total costs.

### Figure 9: Competitive Pricing

Figure 9 and Figure 10 explain pricing and appear complicated at first. There appears to be three graphs of four contexts, but one graph is used three ways. The graph on the left on this page is used three ways: competitive industry in Figure 9 as well as monopoly firm and monopoly industry in Figure 10 on the next page. Here, in this Figure 9, the focus is on the competitive industry (left graph) and the competitive firm (right graph).



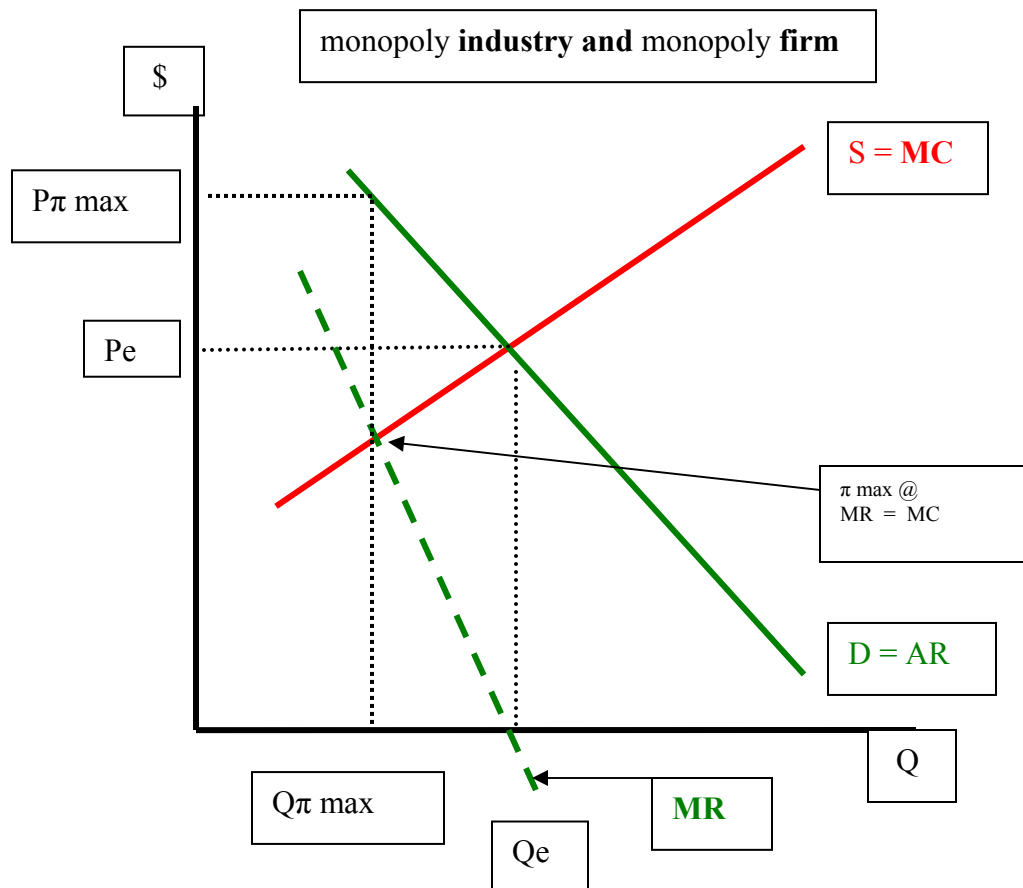
The *competitive industry* does **not** profit maximize, instead the competitive industry clears the market at the equilibrium price and quantity (i.e.,  $TR = TC$  and  $\pi = 0$ ) so that the buyer's obtain all of the *consumer surplus* while every firm earns a normal profit and obtains all of the *producers' surplus*.

Every competitive firm in the competitive industry sells at  $P_e$ , thus each competitive firm's demand curve is flat. A flat demand curve means  $D = P_e = AR = MR$ . Accordingly, every *competitive firm* does profit maximize while earning a normal profit (i.e.,  $\pi_{max} = \pi_a = \pi_n$ ). Additionally, every competitive firm is at equilibrium (i.e.,  $D = S$ ), and the LRATC curve reaches MES at  $D = S$ .

Competition is good because buyers get the Consumer Surplus and because the maximum number of profit maximizing firms, each of which is both at equilibrium and at MES, provide alternatives. Thus, competition yields the *greatest good for the greatest number*.

**Figure 10: Monopoly Pricing**

Other than its interpretation, size, and titles, the graph below is the same as the right graph in Figure 9: Competitive Pricing.



The results of the monopoly industry are the same as the monopoly firm because a monopoly is a market with one seller (*monopsony* is a market with one buyer).

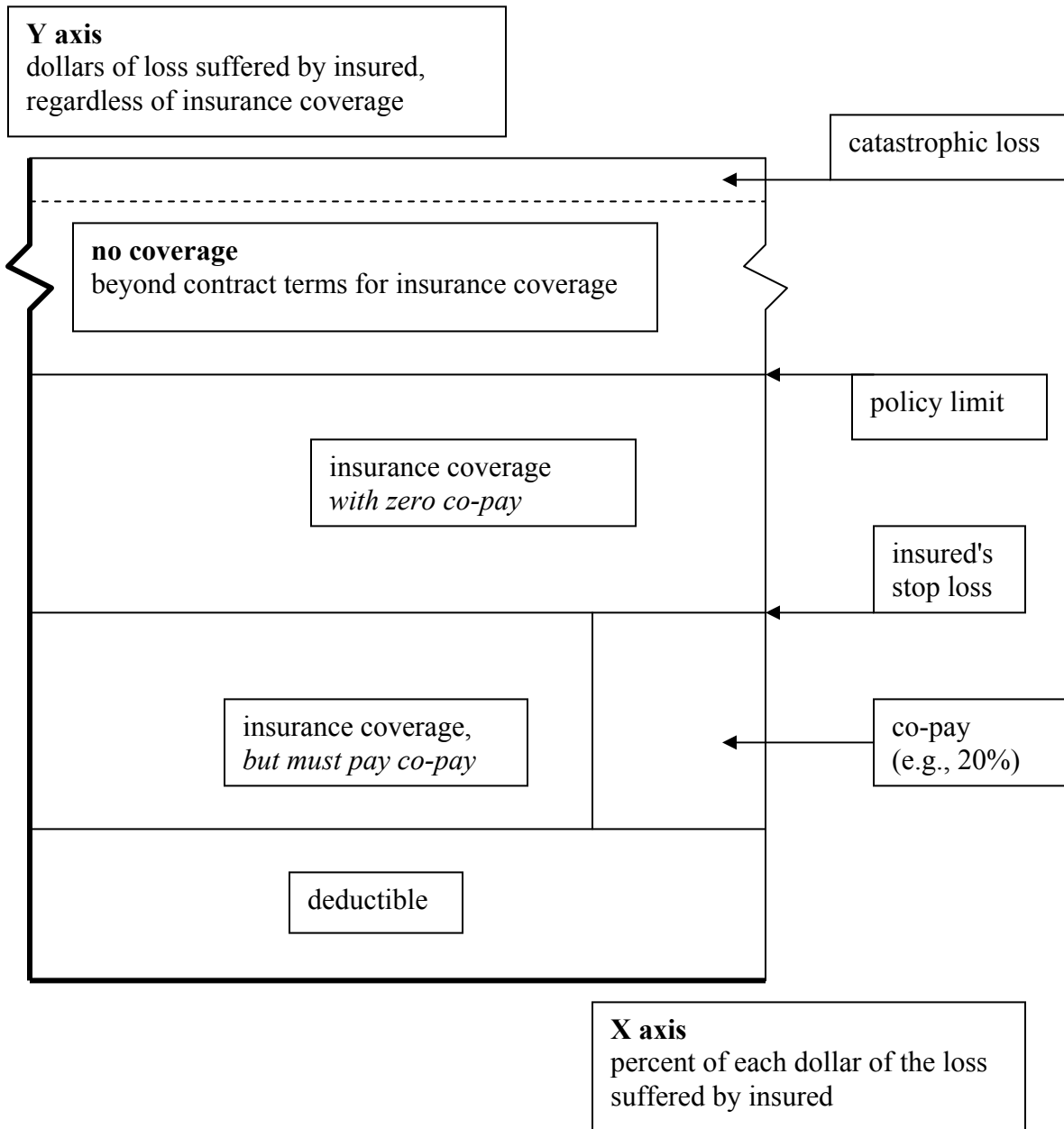
The *monopolist* profit maximizes by **controlling its quantity** supplied to the quantity underneath  $MR = MC$ . There are four steps. Step 1, find  $MR = MC$ ; step 2, drop to the X-axis and set  $Q\pi$  max; step 3, rise to the demand curve where the **consumers control the price**; step 4, turn left to the Y-axis to find  $P\pi$  max.

Note that the profit maximizing monopolist captures some, but not all, of the Consumer Surplus, but does so at the cost of some lost sales. That is,  $\Pi_{max} \neq TR_{max}$ .

Price discrimination, generally, is  $P_a \neq P_b$ . Technically, that general definition is not correct since price discrimination requires  $P_a/MC_a \neq P_b/MC_b$ . Charging different customers different prices can allow the monopolist to capture more, rarely all, of the Consumer Surplus.

**Monopoly is bad** because consumers get less (i.e.,  $Q\pi$  max <  $Q_e$ )  
and consumers pay more (i.e.,  $P\pi$  max >  $P_e$ ).

**Figure 11: Losses Covered by Insurance**



NOTE: The 2003 Medicare prescription drug benefit altered this traditional risk allocation with a novel allocation called a "doughnut hole". The **doughnut hole** is a cessation of insurance coverage for a fraction of the area of normal insurance covered with a co-pay. That is, above the deductible and below the stop loss a new deductible zone is created that has no coverage. The doughnut hole alters both the financial aspects and the political aspects of the coverage.

[http://seattletimes.nwsourc.com/html/nationworld/2001797443\\_medicare21.html](http://seattletimes.nwsourc.com/html/nationworld/2001797443_medicare21.html)

**Table 1: Probabilities from Crime to Sentence**

<u>Event in Process</u>	<u>Event Probability for Criminal</u>	<u>Joint Probability All Events</u>	
		<u>significant digits without</u>	<u>with</u>
commit crime	1.00		
victim detects crime	0.90		
victim reports crime	0.60	0.54	= 0.54
police investigate crime	0.90	0.486	= 0.49
police identify a suspect	0.50	0.243	= 0.25
police make an arrest	0.70	0.1701	= 0.18
prosecutor seeks indictment	0.80	0.13608	= 0.14
prosecutor obtains indictment	0.90	0.122472	= 0.09
prosecutor brings trial	0.90	0.1102248	= 0.08
prosecutor wins trial	0.90	0.09920232	= 0.07
judge sentences criminal to max	0.20	0.01984046	= 0.01

To deter crime, how great must a mandatory minimum be? Let's consider a theoretical crime with instantaneous criminal prosecution (so there are zero time value of money questions). Now, assume the crime yields the criminal \$1.00 at the moment of the crime, and at the very next instant the criminal prosecution due process of law is completed. With a mandatory minimum, using the table above, the judge always sentences to the max upon the prosecutor winning at trial. Thus, the risk to the criminal is 7% rather than 1%. Assuming a 7% risk on a \$1.00 gain, to deter a rational criminal the mandatory minimum must cost the criminal \$14.29 (i.e.,  $\$14.286 = \$1.00 / 0.07$ ). Any penalty below \$14.29 means crime pays.

It is *feasible* for a mandatory minimum to generate an *elastic* response from a potential criminal. But, is it *probable*? In the 18th century England executed by public hanging pickpockets; however, one place you were sure to have your pocket picked was at such a hanging.

In order for a mandatory minimum to generate an elastic response, the potential criminal must know of and reasonably expect the magnified sentence prior to the potential criminal making the decision to commit the crime. While feasible, an elastic response is not likely.

Mandatory minimums are likely to generate negligible changes in criminal behavior and thus are certain to generate substantial increases in grossly disproportionate sentences and grossly disproportionate public expenditures dedicated to punishment. From the perspective of efficiency, are costs to be maximized or to be minimized? Which cost is the appropriate cost, from the perspective of efficiency? Is it the cost imposed on the criminal by a mandatory minimum?

If one assumes<sup>1</sup> the criminal is a Rational Person, then the enhanced sentencing of a mandatory minimum is such a remote and low probability that it does not generate an elastic response.<sup>2</sup>

<sup>1</sup> Can a person --be-- a criminal if that person is not rational? Is the Rational Person of economics the same as a rational person of the law?

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<sup>2</sup> Would a politician that is a Rational Person support mandatory minimums? If so, when?