

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

Expectations are volatile

(i.e., capable of fast and large changes).

Technology is dynamic (i.e., volatile network effect).

DEMAND

& size of buyers

horizontally sum

income

prices of related goods

substitutes (A or B)

compliments (A and B)

tastes

expectations

CAPITALISM

ELEMENTS (means)
private property

and

FUNCTIONS (ends)
embody self interest
makes your subj. objective

prices

measure self interest
voluntary

markets

coordinate self interest
knowing (i.e., information)

competition

- 1. free entry & free exit**
- 2. "large" number of buyers & sellers**

regulate self interest
alternatives = voluntary

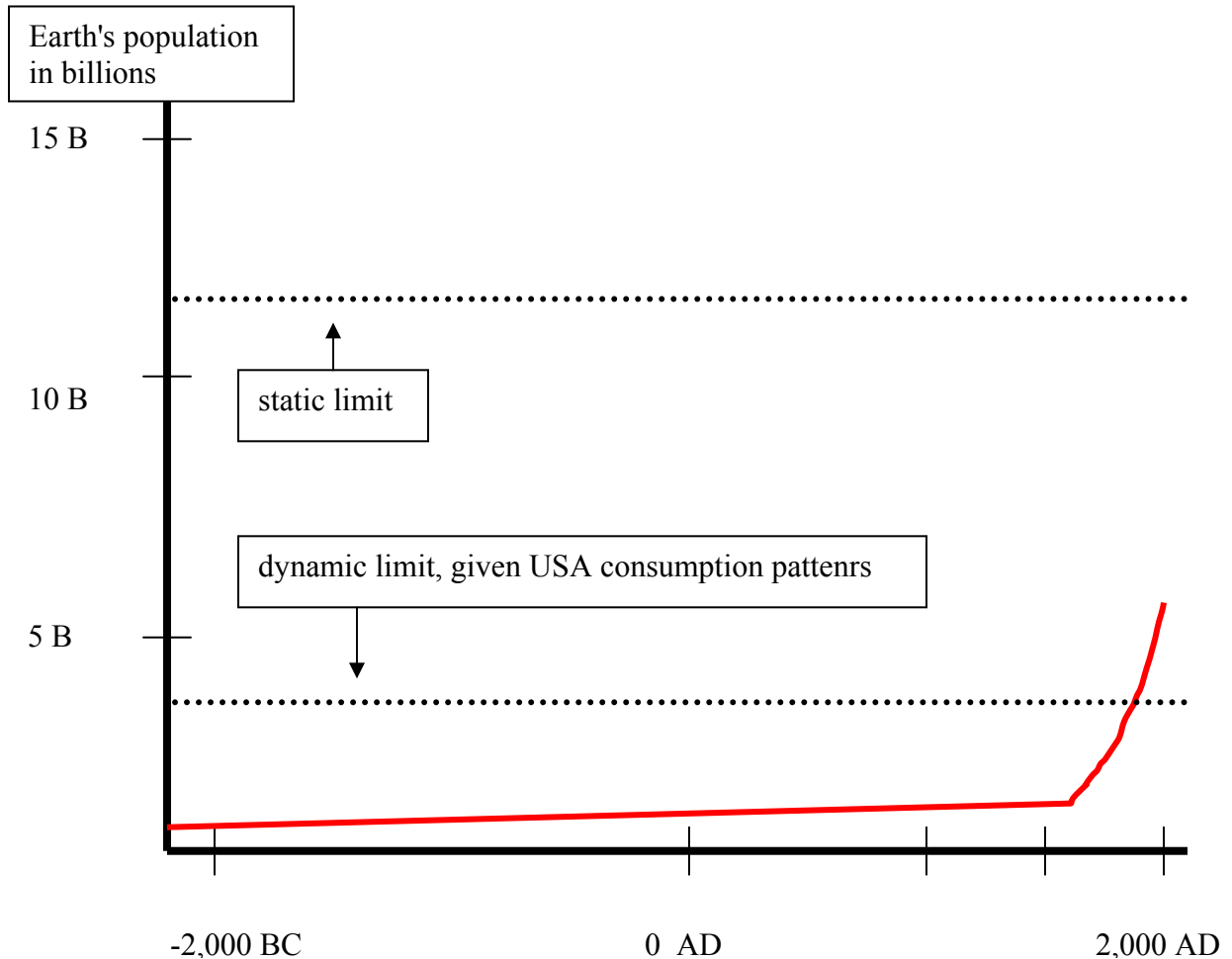
AND

government

facilitates p.p., p., m., & c.

- 1. defines rights**
 - a. private property**
 - b. contracts**
 - c. torts**
 - d. crime**
- 2. set transaction costs**

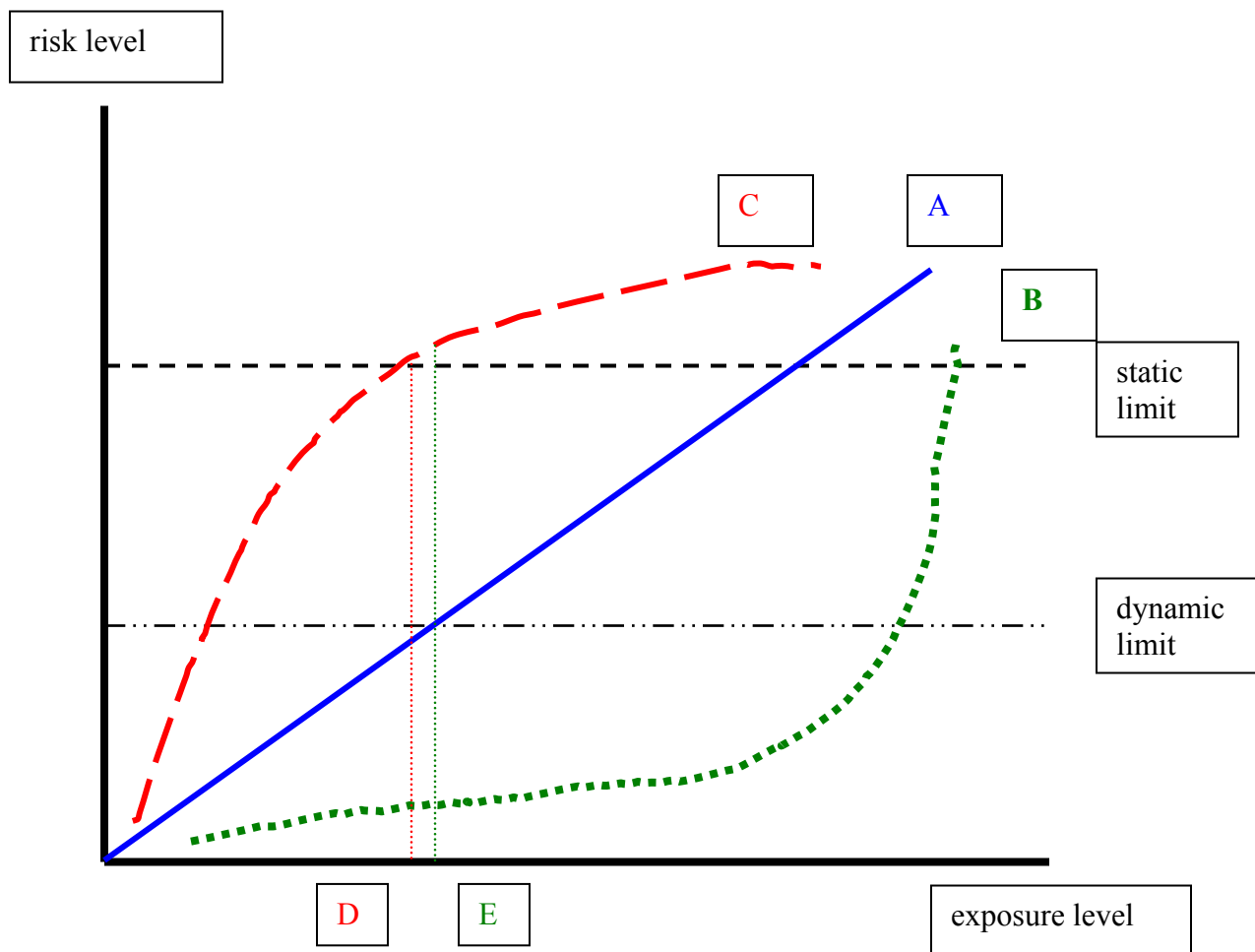
Figure 1: World Population



No human born before 1920 lived long enough to witness Earth's population double. Every human born after 1950 and alive today has witnessed Earth's population 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



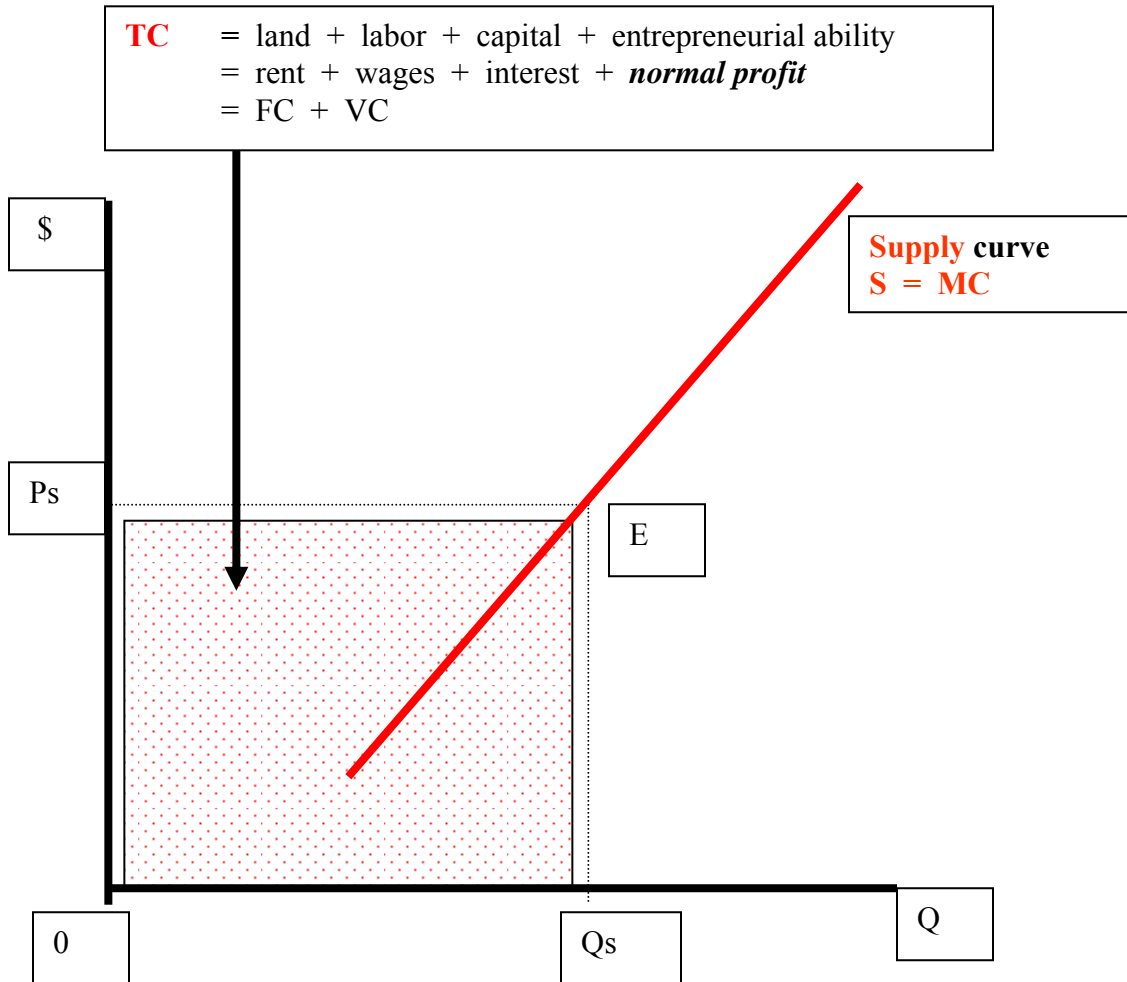
This Figure is a very gross over simplification. For example, there would not be this clear of a consensus on where the dynamic or the static limits were, and both would be seen as vacillating bandwidths rather than lines. That said, this Figure helps us to see the issues.

- 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.

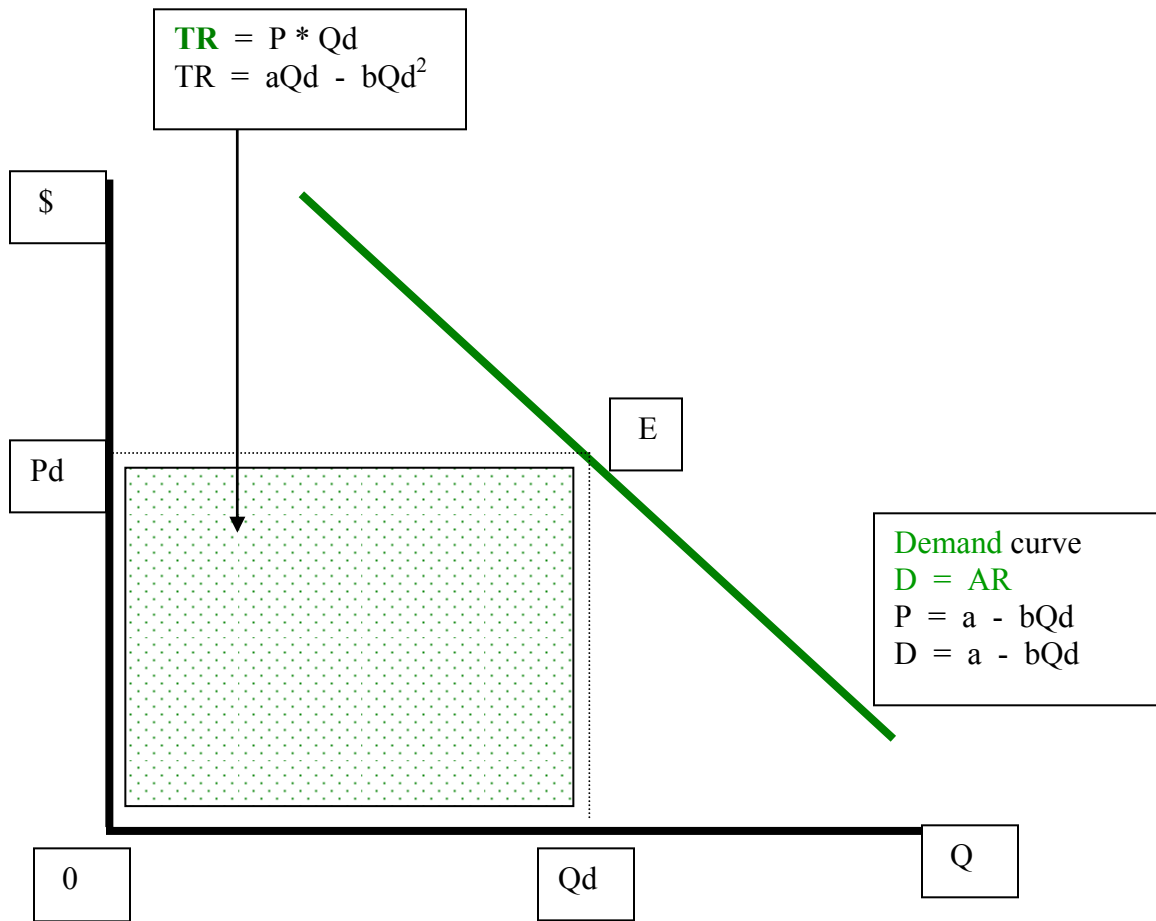
Figure 3: Law of Supply



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 $0P_sEQ_s$

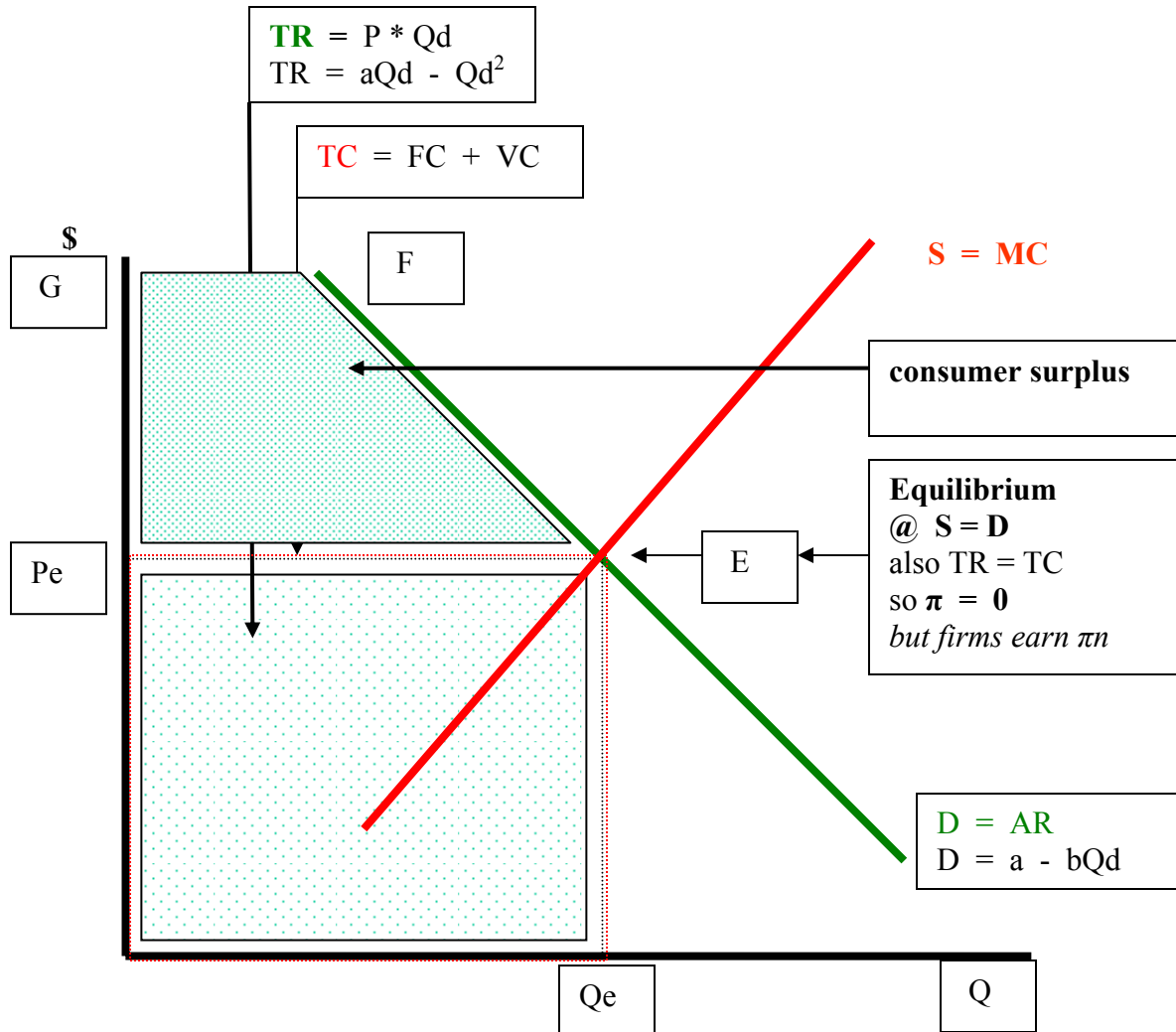
Figure 4: Law of Demand



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 Pd and the quantity demanded at Qd , Total Revenue (i.e., $P * Qd$) is the area bounded by $0PdEQd$.

Figure 5: Equilibrium



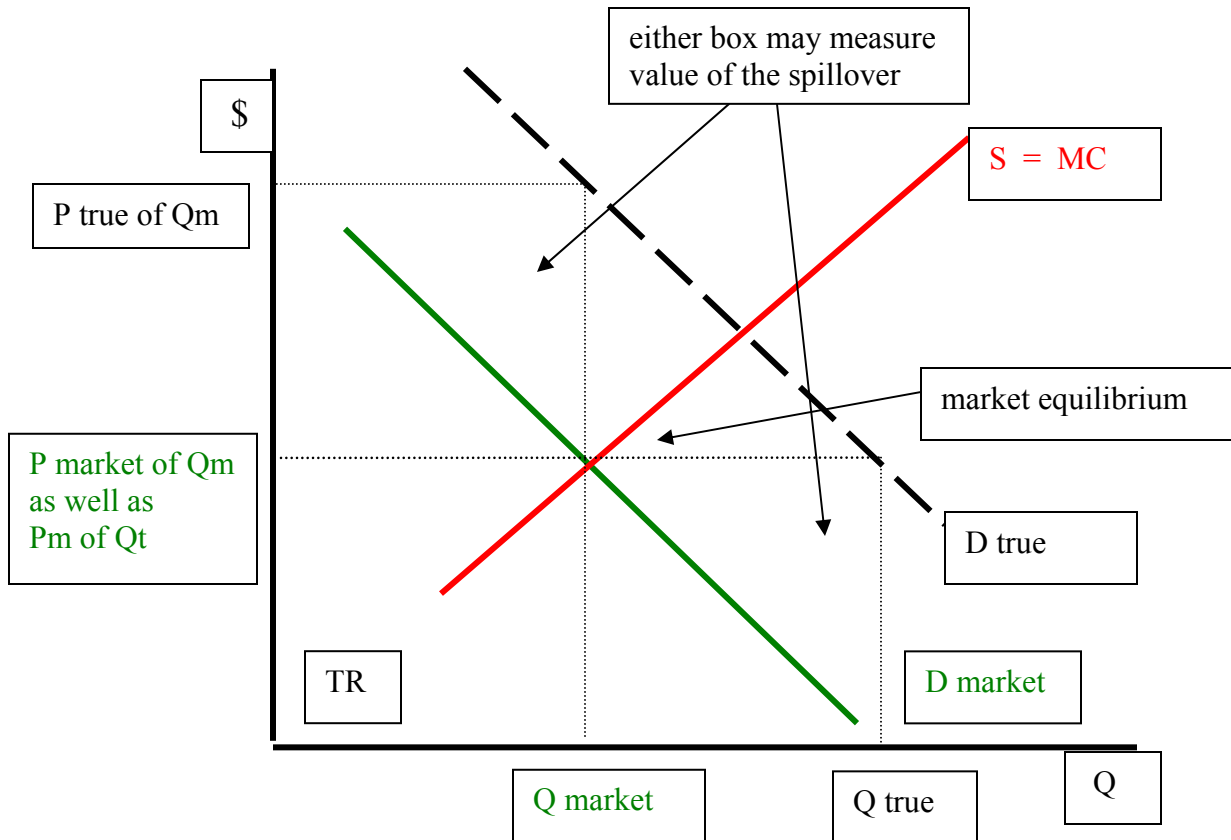
Buyers would have been **WILLING AND ABLE** to pay prices above P_e , but, due to competitive pressures can not be forced to do so by sellers. Thus, buyers obtain the **Consumer Surplus**, the area bounded by P_eGFE .

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

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

Figure 6: Spillover Benefits



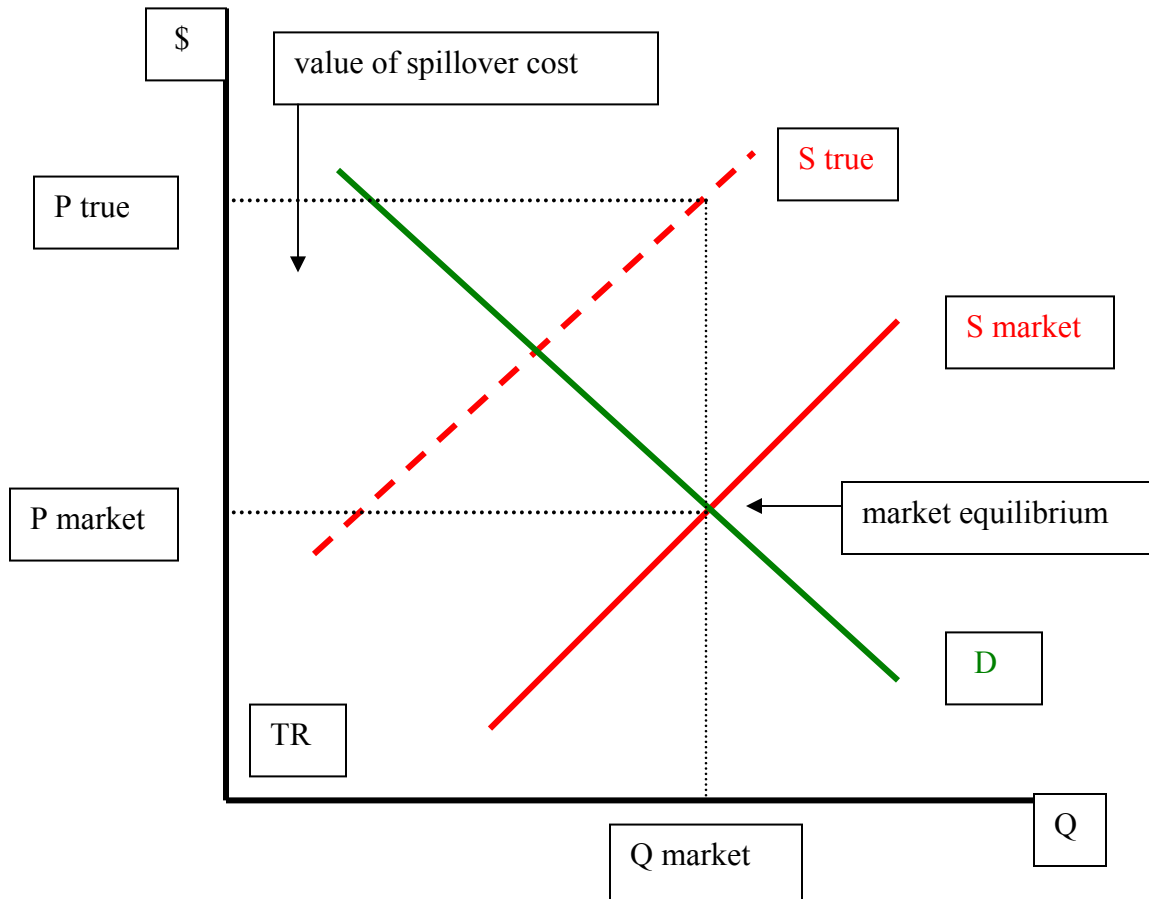
The market result is equilibrium at P market and Q market. Given this market result, there are two ways to view graphs of spillovers. Pick one and use that one repeatedly. The spillover cost curve, Figure 7, only uses # 2, entering from the quantity axis.

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).

The spillover causes value to escape being captured by the market price. That escaped value is *one of the rectangles* outside of TR (i.e., either top or right, but not both).

Figure 7: Spillover Costs



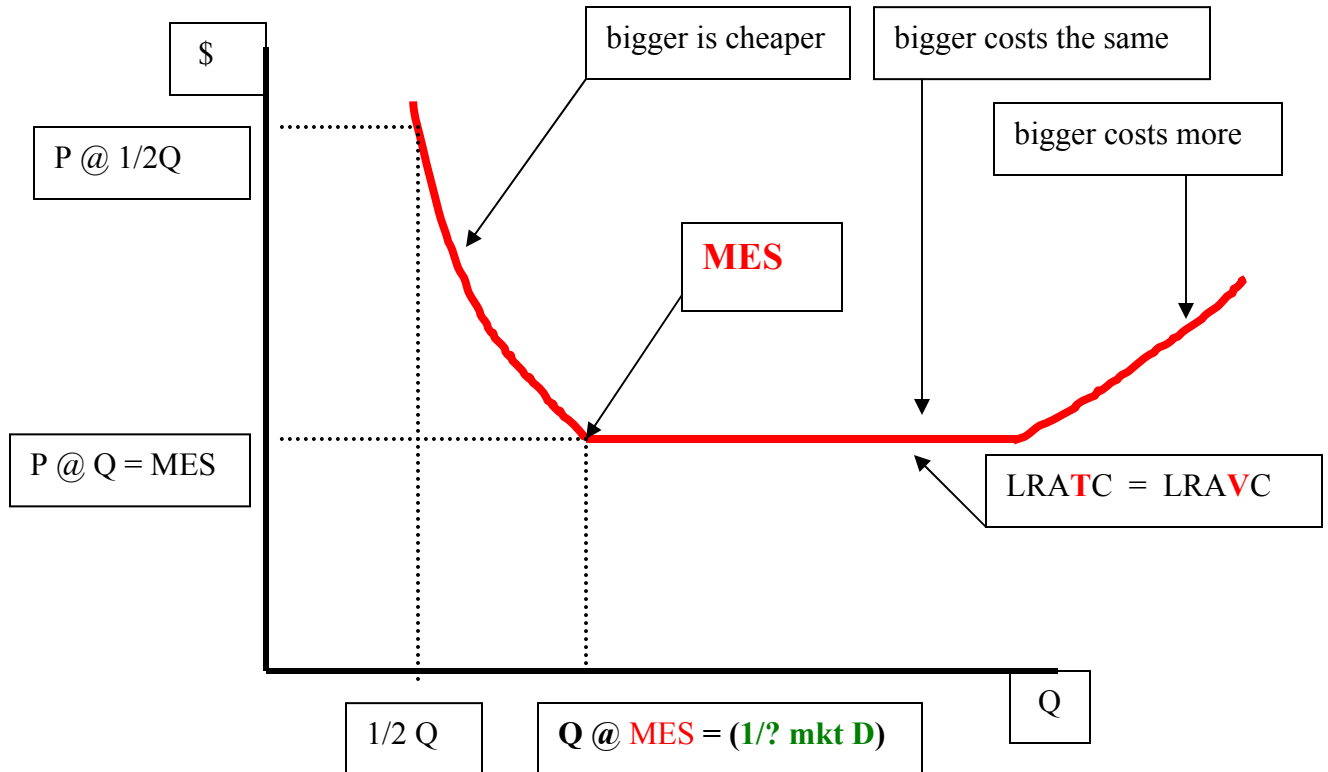
When there are spillover costs, at the equilibrium of P market and Q market there will be excess consumption. If the market moved to an equilibrium at $D = S \text{ true}$, then both price would go up **and** quantity would go down. Alternatively, if the market stays at Q market, then price per unit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

Figure 8: Minimum Efficient Size (MES)



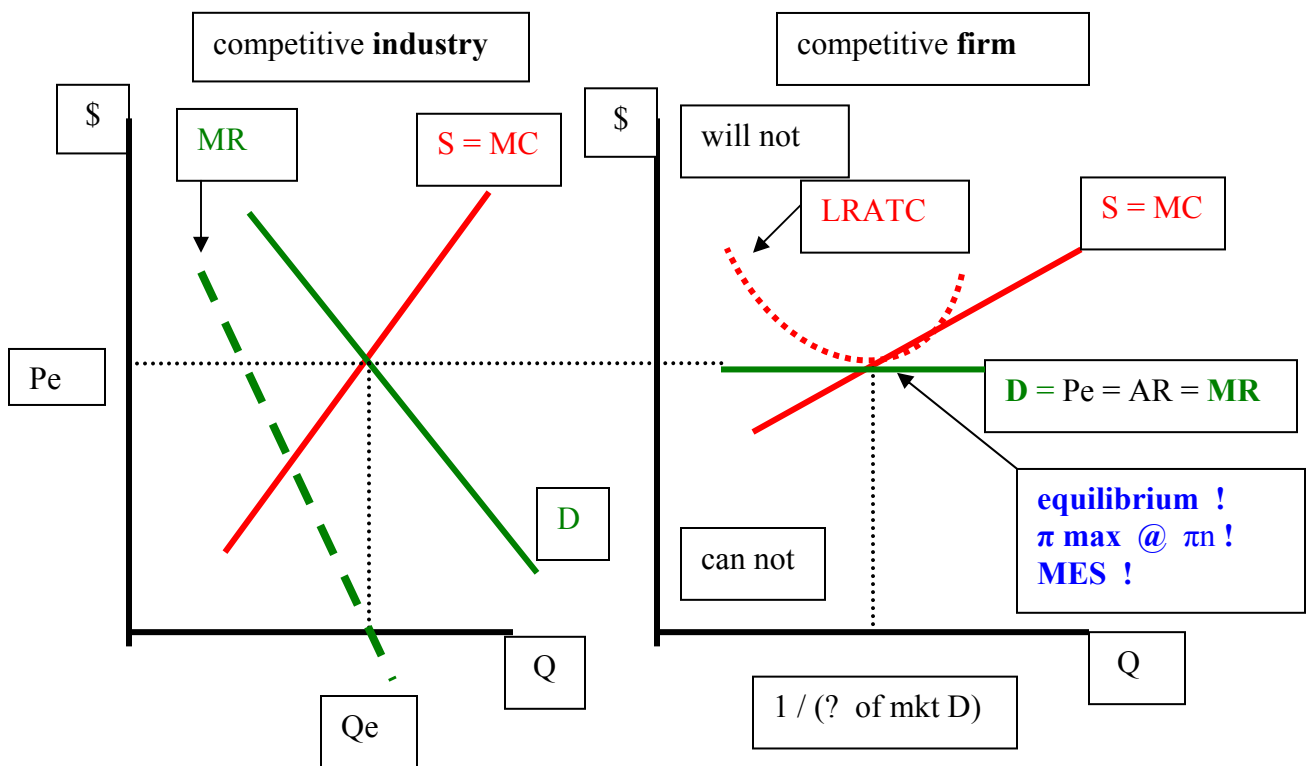
A gross misinterpretation of the MES curve is that all firms *must* be large to be efficient. The correct interpretation of the MES curve is that each firm must seek a size consistent with its market demand. Both Rolls Royce and Ford can continue to exist and prosper, but Ford's LRAVC will be less.

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 suspect (e.g., 1/16 tends to be far more competitive than 1/4).

$LRATC = LRAVC$ 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

Pricing Figures 9 and 10 appear complicated at first. There are three graphs, but one graph is used three ways. The graph on the left on this page is used three ways: competitive industry, monopoly firm, and monopoly industry; the latter two are shown in Figure 10 on the next page. Monopoly pricing will be the focus on the Figure 10. Here, in this Figure 9, the focus is on the competitive industry (left graph) and the competitive firm (right graph).



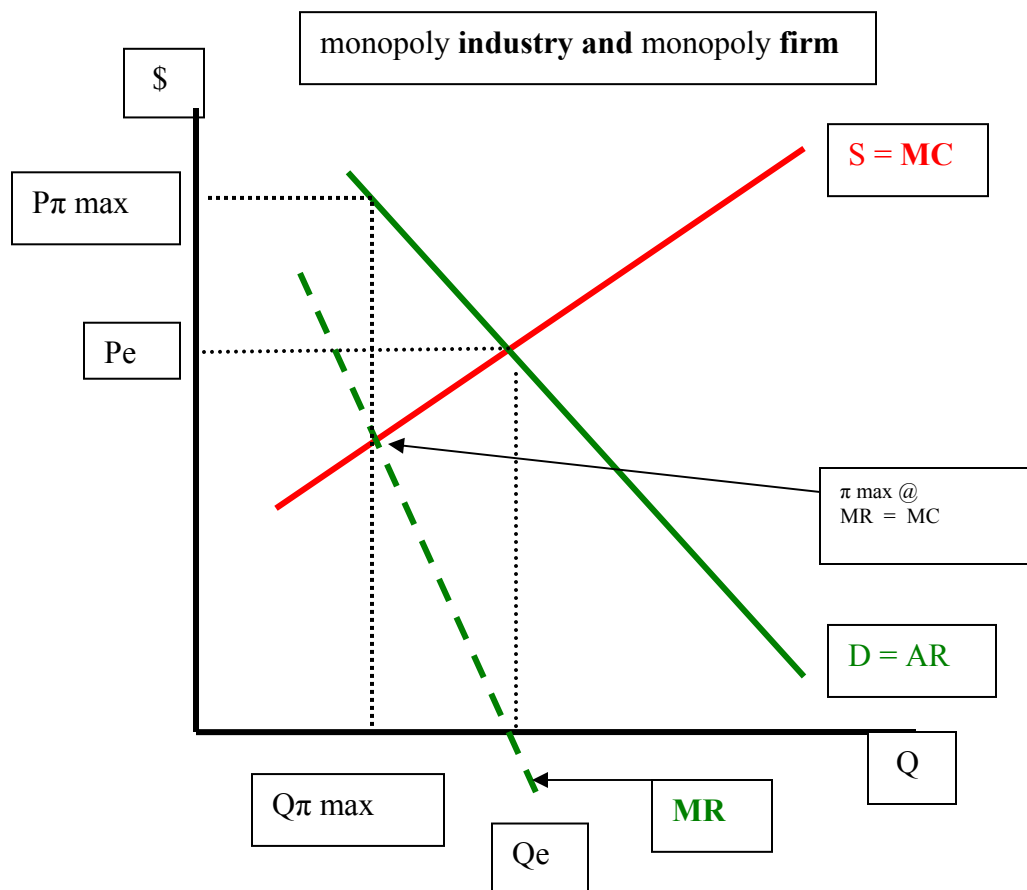
The *competitive industry* does **not** profit maximize, instead the competitive industry clears the market at the equilibrium price and quantity (i.e., $TR = TC$ and $\pi = 0$) so that the buyer's obtain all of the *consumer surplus* while every firm earns a normal profit.

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.



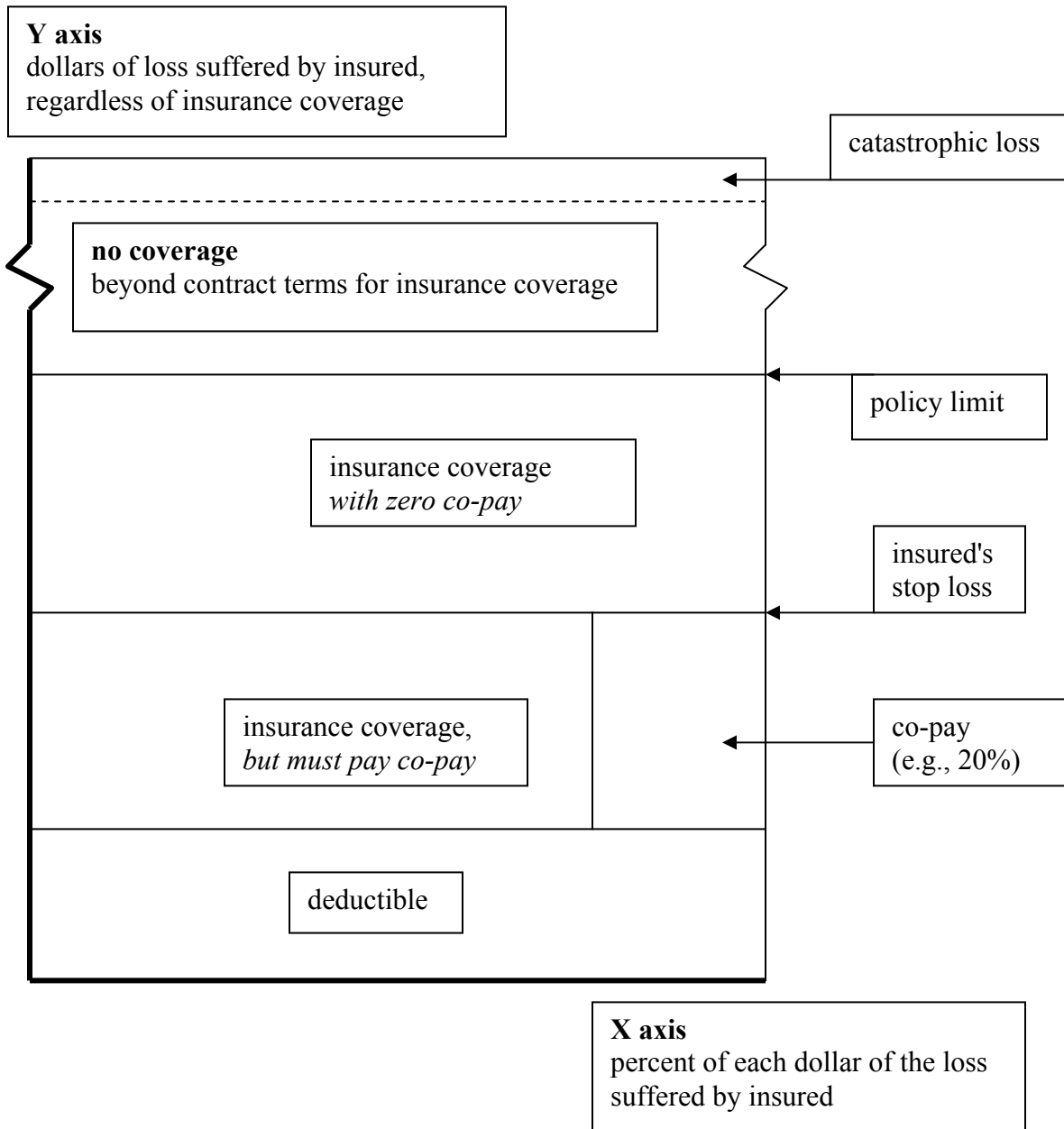
The results of the monopoly industry are the same as the monopoly firm because a monopoly is a market with one seller (monopsony if one buyer).

The *monopolist* profit maximizes by *controlling its quantity* supplied to the quantity underneath $MR = MC$. 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 monopolist captures some, but not all, of the Consumer Surplus, but does so at the cost of some lost sales. Price discrimination (i.e., charging different customers different prices) can allow the monopolist to capture more, rarely all, of the Consumer Surplus. See, Chapter 8 Unlawful Discrimination section.

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". The *doughnut* 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 zone is created that has no coverage. The doughnut alters both the financial aspects and the political aspects of the coverage.

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			
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

The 6% figure is relevant to a mandatory minimum. If the crime yields the criminal \$1.00 on the date of the crime, and the sentence on the date of the sentencing costs the criminal \$16.67 (i.e., $\$16.667 = \$1.00 / 0.06$), then the criminal is indifferent between committing and not committing the crime.

It is *feasible* for a mandatory minimum to generate an *elastic* response from a potential criminal. Is it *probable*?

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 generate substantial increases in grossly disproportionate sentences and grossly disproportionate public expenditures dedicated to punishment. If one assumes 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.¹

¹ Would a politician that is a Rational Person support mandatory minimums? If so, when?