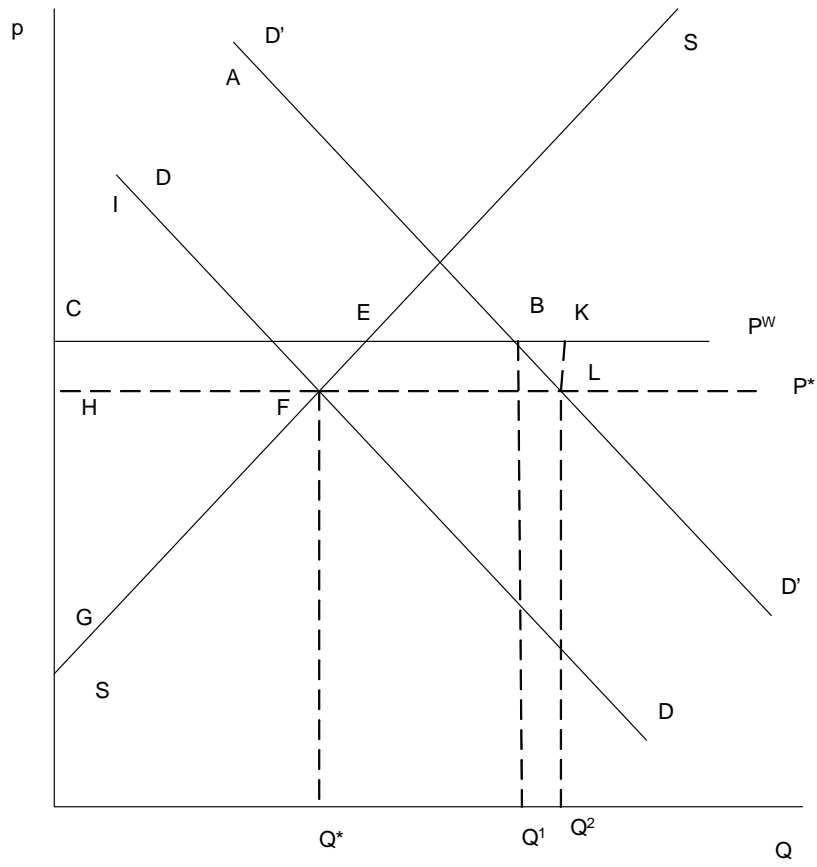


0.1 A competitive industry

- Many buyers and sellers such that each buyer and seller does not believe that their output decision affects the price of output that they face.
- Measure welfare gain of a society from the availability of a good by the sum of consumer and producer surplus.

0.2 Capping electricity prices in Ontario

- Domestic supply curve SS .
- Domestic demand curve DD .
- Equilibrium price p^* and quantity Q^* .
- World price is p^w which is higher than p^* . So all electricity produced domestically and no imports.



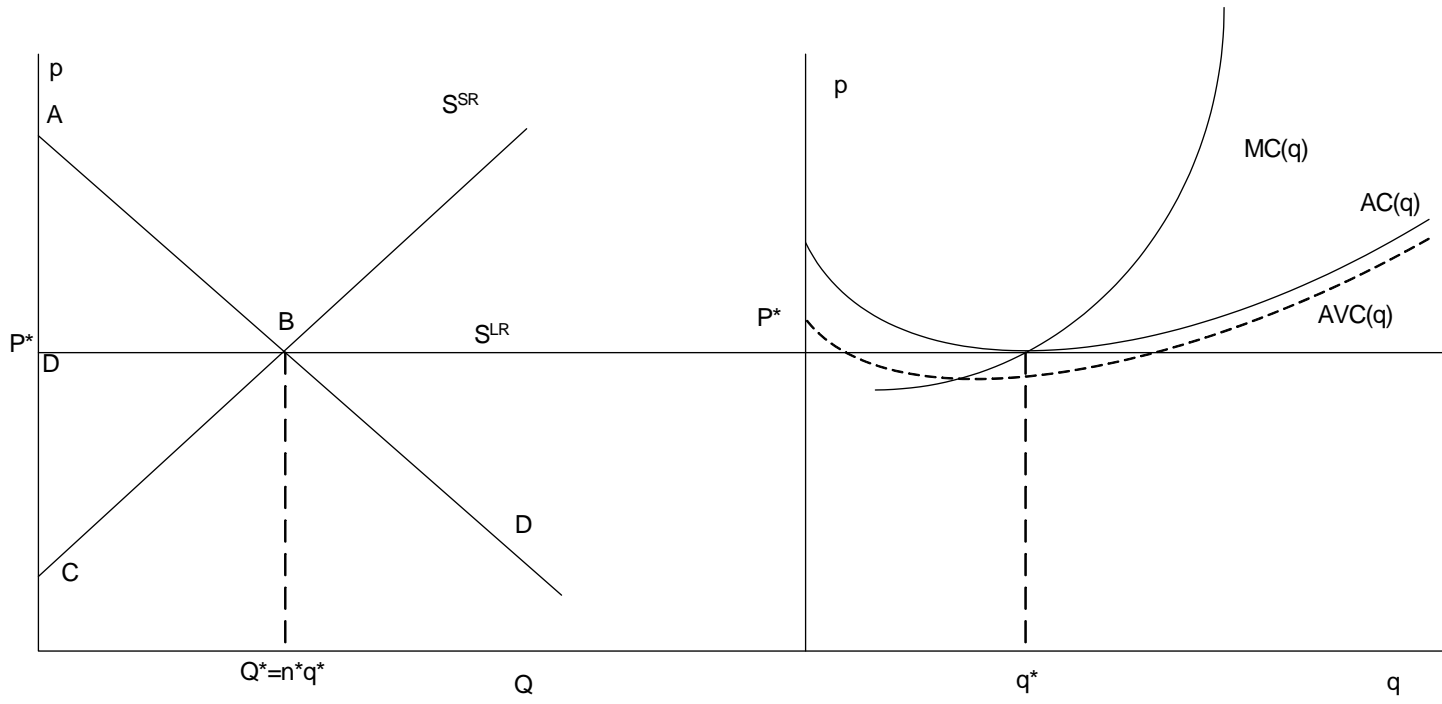
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- Consumer surplus IFH . Producer surplus HFG .
- Social welfare is sum of consumer and producer surplus, IFG .
- New domestic demand curve $D'D'$.
- Without price control, price rises to p^w .
- Domestic supply increases to CE . Imports are EB . total demand is Q^1 .
- Consumer surplus rises to ABC . Producer surplus rises to CEG .

- Social welfare increases to $ABEG$.
- So why are consumers complaining? What is consumer surplus not measuring?
- Let government cap prices to consumers to p^* .
- Consumer demand increases to Q^2 .
- Let government pay domestic and foreign suppliers p^w .
- Then domestic supply is CE and foreign supply is EK .
- New consumer surplus is ALH .

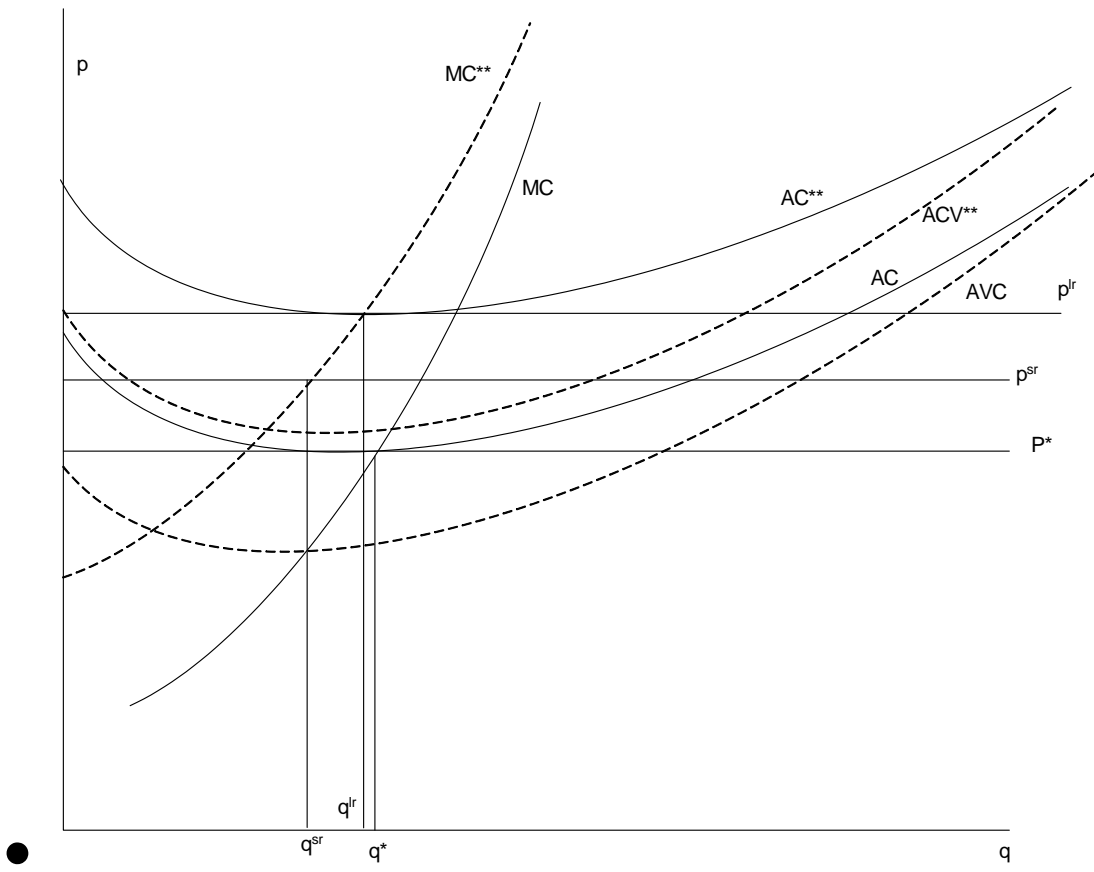
- New producer surplus is CEG .
- Revenue loss to government is $EK * (p^w - p^*)$.
- New social welfare is $ALH + CEG - EK * (p^w - p^*)$.
- Loss of social welfare is BKL .
- But government is getting bad publicity from wind-fall gain from domestic producers (price gouging). So government decides to cap domestic prices at p^* . What is loss of social welfare in this case? Then government has to buy even more electricity at world price. But producer surplus is lost.

1 Per unit output tax on fast food

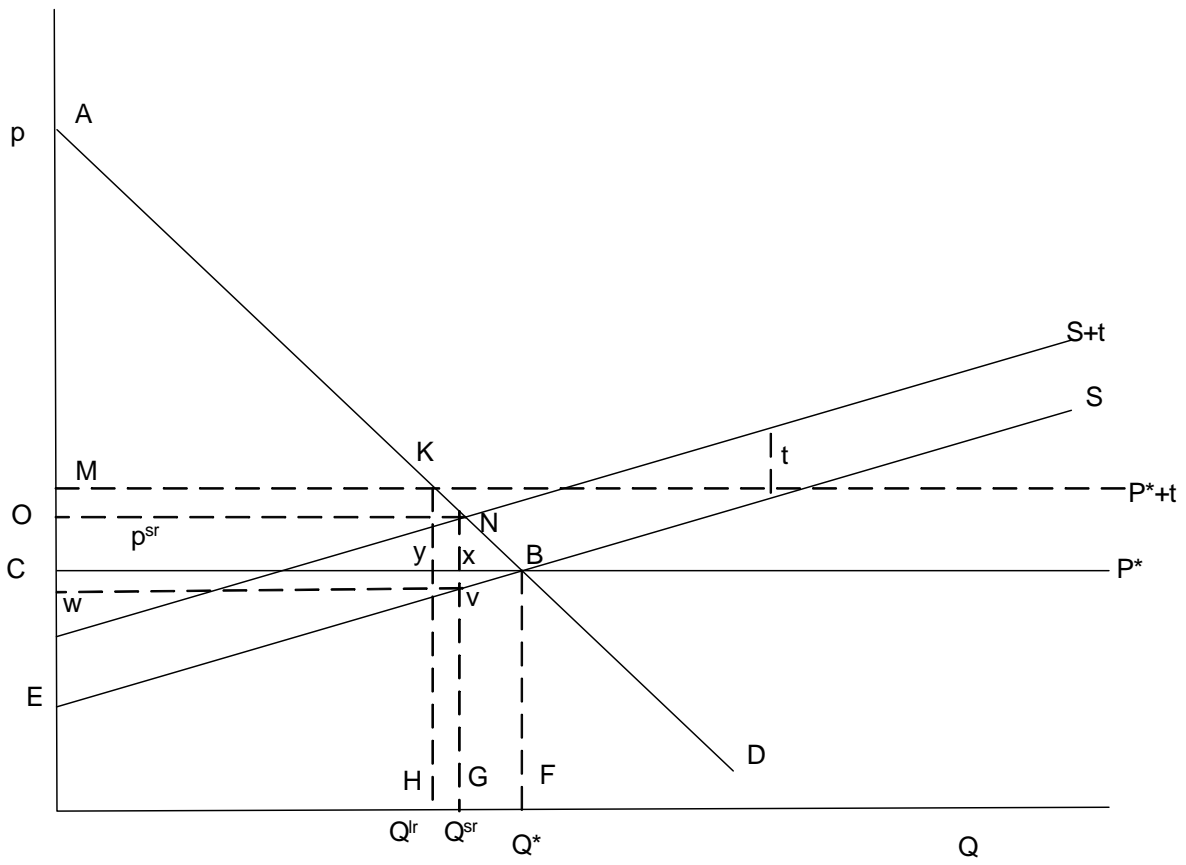
- Assume that the restaurant industry has an elastic supply of firms with identical cost curves.
- It is in long run equilibrium with an equilibrium price of p^* , n^* firms and q^* output per firm. Look at figure 1.
- Consumer surplus: ABD
- Producer surplus: DBC which is just equal to revenue minus variable cost. DBC must be equal to total fixed cost of industry. So industry makes zero profits.
- Short run social welfare is ABC.



- Long run social welfare is ABD.
- Now add a per unit output tax of t to sellers.
- This will raise the marginal cost of output by t .
Why?
- AC, AVC, MC all rise by t to AC^{**} , AVC^{**} and MC^{**} .
Look at figure 2.



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- What happens to price to consumers in industry?
Rise to p^{sr} due to fall in output by each firm (to be shown).
- What happens in the short run to the supply of output to each firm? (move from q^* to q^{sr}).
- What happens to profits for each firm? Each firm is making negative profits.
- Industry supply in short run is $S + t$.
- Who bears the burden of the tax? Consumers pay Nx , producers pay xv . $Nx + xv = t$



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- What is the change in short run social welfare? Look at figure 3. Original surplus is ABC . Since short run price has increased to p^{sr} , consumer surplus falls to ANO . So $ONBC$ is loss of consumer surplus. Firms make negative variable profits in short run. They lose $CBVW$. Government (taxpayers) gain $ONVW$. So NBV is loss of social welfare in short run.
- What happens to the number of firms in the long run?
- What happens to long run equilibrium price of output in the industry? ($p^{lr} = p^* + t$)
- What happens to long run profits?

- Who bears the long run burden of the tax?
- What is change in long run social welfare? New consumer surplus in long run is AKM. Lost of consumer surplus is MKBC. Government gains MKYC. So loss of social welfare is MKYC.
- In long run, consumers bear burden of taxation in competitive industry with perfectly elastic supply of firms. Note that there is no social cost of firms to industry because each firm in the industry before and after makes zero profits.
- Note that there will be a loss of producer surplus in long run if long run supply curve is not perfectly elastic. I.e. some producer have rents. Then there is a loss when producers with rents are driven out of the industry.