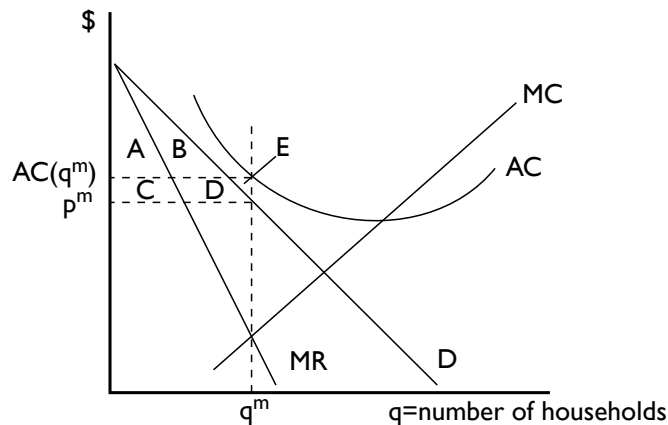


First Quiz Answers

1. *RuralBroadband_a.*

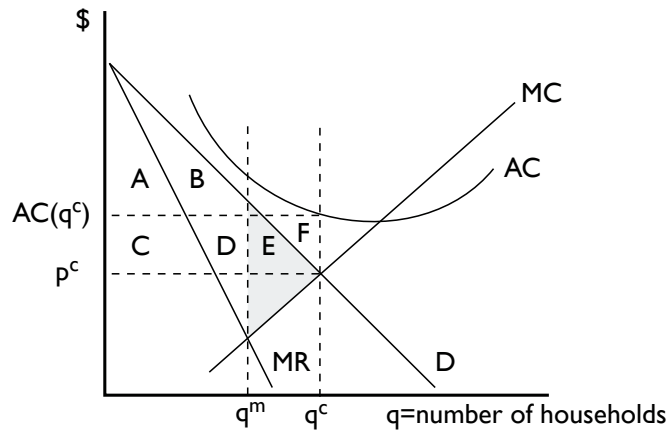
- (a) Given that the MC is upward sloping, AC will be U-shaped and cross MC at its lowest point. But it can shift anywhere up or down along the MC curve depending on how large the fixed costs are. In this case, fixed costs are very high relative to demand, which makes sense since infrastructure industries usually have high fixed costs.
- (b) The monopoly would maximize profits by setting $MR=MC$. In this case, that still causes a loss equal to $C+D+E$.



- (c) Without a subsidy, the market will simply not exist since even a monopoly makes a loss. With a subsidy equal to $C+D+E$, the market will exist and it will generate consumer surplus of $A+B+C+D$. Area E represents some additional costs not justified by demand, but it is much smaller than $A+B$ so there is a welfare gain.
- (d) For clarity, there is a second graph below. At the monopoly solution from (c), there is deadweight loss shown by the shaded area. If the government increased the subsidy to $C+D+E+F$ and combined it

with a mandate that the firm produce the competitive quantity q^c and charge the competitive price p^c , this deadweight loss would be eliminated. The consumer surplus is now a quite large area A+B+C+D+E (plus the tiny tiny triangle above E), which again needs to be weighed against some added costs F. But since F is smaller than A+B, this again increases total welfare.

It should be noted that if the government cannot perfectly measure q^c , there may be a difficult regulatory principal-agent problem here, and it may take some additional and unwelcome costs to solve it.



- (e) Two answers are possible here. The first is to say that since the Smith family buys the Internet service, any consumer surplus they receive is internal to the transaction and thus does not qualify as an externality. The second is to say that Skype and WOW are networked goods, so there may be a positive direct network externality by adding the Smiths to the user base. This would accrue to other users, not to the Smiths.