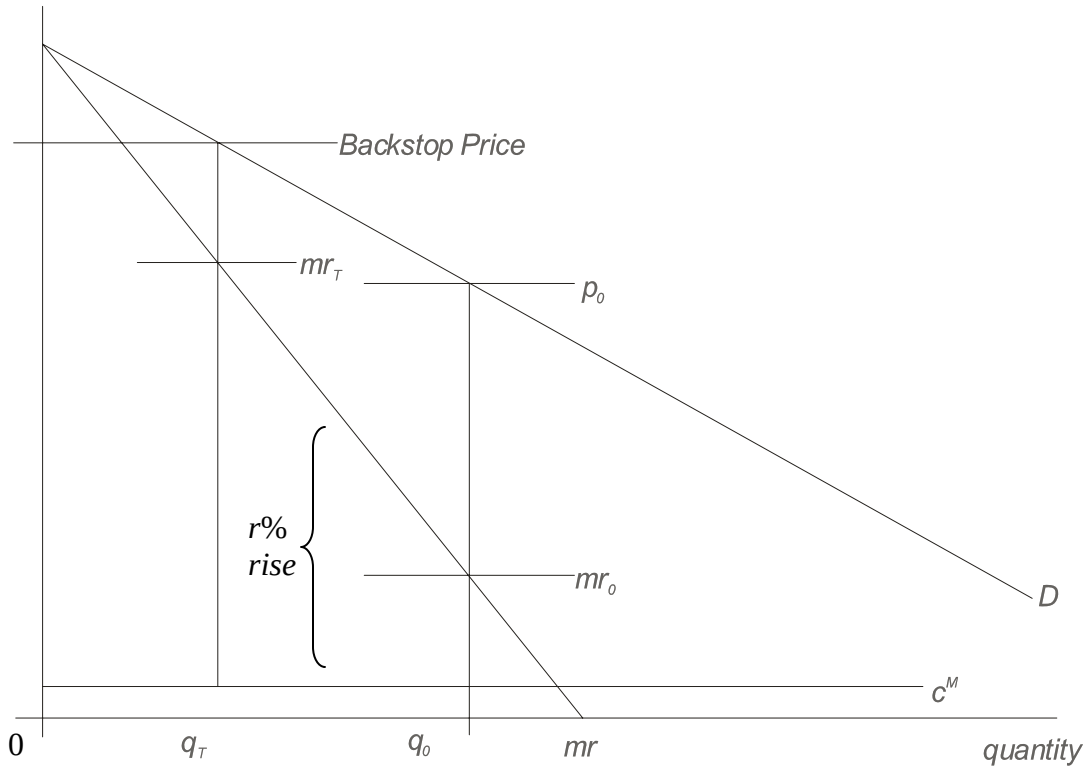
Monopoly Oil Extractor Facing Competitive Backstop Supply

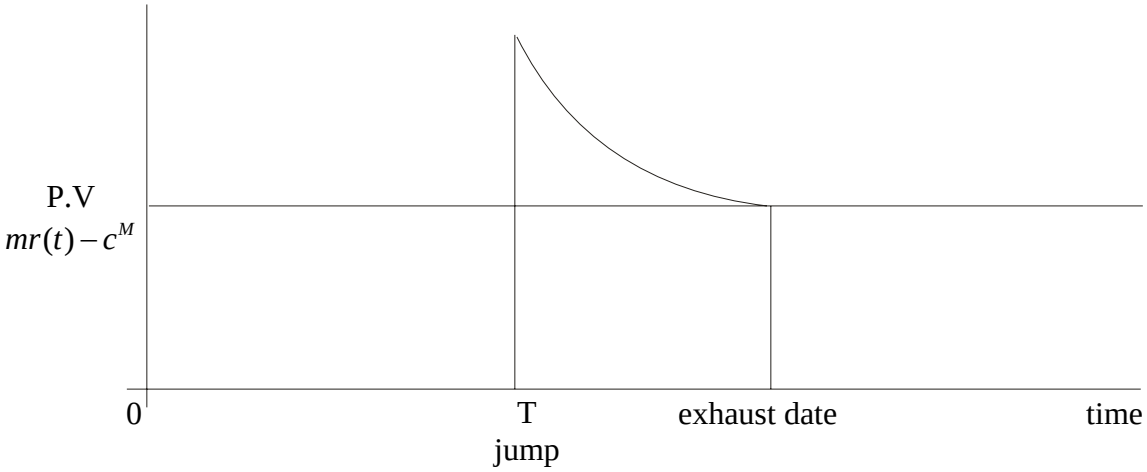
Monopolist maximizes present value of profit by "getting rid of" its stock first. It does this exhaustion in TWO PHASES. Some stock goes in an ordinary

$$\frac{\frac{d\left[mr(t)-c^M\right]}{dt}}{mr(t)-c^M}=r \quad \text{phase.}$$

Then, there is a MR jump to the second phase. $mr(t)-c^M$ is CONSTANT in the second phase with *mr(t)* one cent below supply price from backstop supplier. Present value of $mr(t)-c^M$ is DECLINING in this second phase.



Two monopoly phases:



At *T*, *mr(t)* jumps up to Backstop price. Then $mr(t)-c^M$ is constant in current value but shrinking in present value terms.