MNPB including consumers

Calculation of Private Benefits for various social groups. First, totals; later, marginal.

Consumers: $\int_0^{\bar{q}} D(\alpha)\, d\alpha$ gross consumer surplus

$\int_0^{\bar{q}} D(\alpha)\, d\alpha - p\bar{q}$ net consumer surplus

Firms: $p\bar{q}$ gross (total revenue)

$p\bar{q} - C(\bar{q})$ net (= profit)

Society: $\int_0^{\bar{q}} D(\alpha)\, d\alpha - p\bar{q} + p\bar{q} - C(\bar{q})$ net

$= \int_0^{\bar{q}} D(\alpha)\, d\alpha - C(\bar{q})$ net.

Society, marginal: $D(\bar{q}) - MC(\bar{q})$ → marginal social surplus ("social" here is only firms + their customers)

(Leibniz' Rule)

= MNPB.

("Society" here leaves out the pollution victims; it includes the firm and the firm's consumers. The pollution victims get represented by the marginal external cost curve, which is not the topic of this page.)
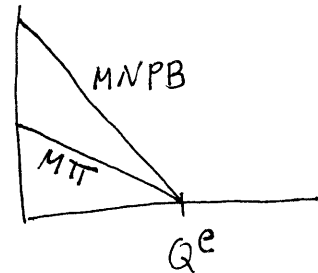

So MNPB > $M\pi$ $\forall$ $Q < Q^e$
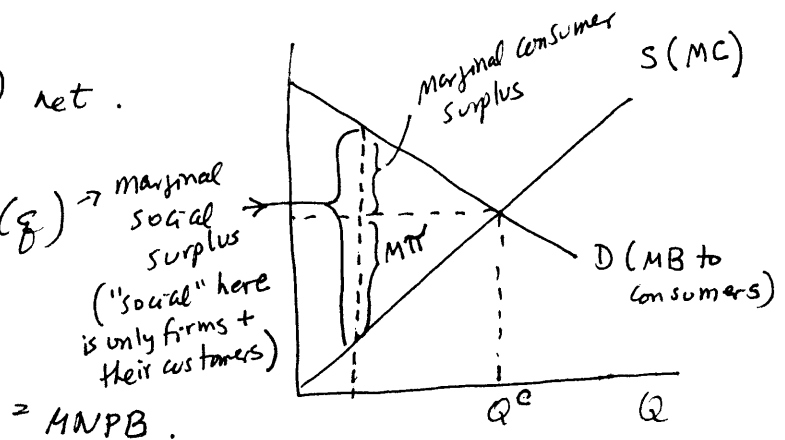
$MNPB(Q^e) = M\pi(Q^e) = 0$.

note: "$\forall$" means "for all"

It follows that the point where "marginal profit = 0" is the same as the point where MNPB = 0, even though marginal profit and MNPB are not usually the same thing.