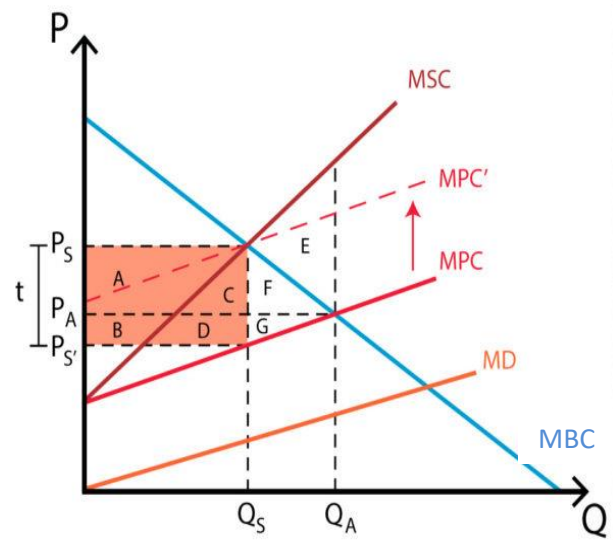# Pigouvian Taxes

Markets are supposed to organize activity in a way that leaves everyone better off. But the interests of those directly involved, and of wider society, do not always coincide. Economic activities of individuals and firms can have impacts (externalities) on others who are not involved directly in the activity. For example a farmer spraying weedkiller that destroys his neighbour's crop or motorists whose cars spew fumes into the air, creating air and noise pollution for everyone. Left on their own, the producers are interested in their own net production and don't consider the social costs of the productive activities. As such the market prices do not reflect these external costs or the wider costs the society bears. In presence of negative externalities, the social cost of a market activity is not covered by the private cost of the activity. In such a case, the market outcome is not efficient and may lead to over-production. Negative externalities prevent a market economy from reaching efficient equilibrium when producers do not take on all costs of production. **Pigouvian tax** named after British economist Arthur Pigou is a tax meant to discourage activities that impose a cost of production onto third parties and society as a whole. The tax is intended to correct an inefficient market outcome (a market failure), and does so by being set equal to the social cost of the externalities.

In his book *The Economics of Welfare*, Pigou argues that industrialists seek their own marginal private interest. When the marginal social interest diverges from the marginal private interest, the industrialist has no incentive to internalize the cost incurred by the social. For instance Pigou noted that alcohol producers benefited from the sale of alcohol but did not have to pay the external costs associated with heavy drinking. These external costs can come in the form of higher maintenance costs of the police and prisons (because of the crime associated with alcohol) and health care requirements. Therefore, he argued that a tax on alcohol could discourage excess drinking and more importantly raise public funds to deal with the external costs of alcohol drinking. If a factory is built in the middle of a crowded neighborhood, the factory causes incidental negative externalities. Higher congestion, noise and air pollution, loss of health for the people in locality, contaminated properties etc. are the disservices caused in the neighbourhood. The cost of building and running the factory however does not take these social costs into account. Increased public healthcare costs associated with tobacco and sugary drinks consumption are some examples where Pigouvian taxes are applicable. Another Pigovian tax, is a tax on plastic bags, and sometimes even paper bags. This encourages consumers to bring their own reusable bags from home to deter the use of plastic and paper. Plastic is a by-product of burning fossil fuels and results in the damage of marine life, while paper bags encourage deforestation. Tax on petrol, carbon emission tax, congestion charges etc. are other different pigouvian tax.

When the marginal social cost exceeds the marginal private benefit, the cost-creator over-produces the product. To deal with over-production, Pigou recommends a tax placed on the offending producer. If the government can accurately gauge the social cost, the tax could equalize the marginal private cost and the marginal social cost. In more specific terms, the producer would have to pay for the negative externality that it created. This would effectively reduce the quantity of the product produced, moving the economy back to a healthy equilibrium.

A Pigovian subsidy works on the same basis – if a good has positive externalities, public benefits from market activity. But those who receive the benefit do not have incentive to pay for it and the market may under-supply the product. The government can give a subsidy for socially beneficial products equal to the marginal social benefit of the good to encourage increased production.

The working of a Pogouvian tax can be graphically illustrated as below. Consider a negative externality problem using a polluting factory as an example. The horizontal axis measures the quantity of output produced by the polluting factory and the vertical axis measures product price and social and private benefits in monetary units. The marginal private benefit curve (MPB) represents the marginal benefit of the factory for each level of *production* which declines as the amount of output increases. The marginal private cost curve (MPC) shows the *marginal cost* of the factory as output rises. The more the factory produces, the more it pollutes and hence the bigger the negative effects. This externality is represented by the marginal damage

curve (MD) which gradually rises with increasing production. Lastly, the marginal social cost (MSC) represents the total marginal cost borne by the whole society, and is constructed by adding together the private costs and social costs. As is clear the marginal private cost curve lies below the marginal cost curve since the producer does not consider the external costs (shown by MD curve) as its cost.

The producer equates its marginal costs to its marginal benefit to reach the equilibrium. The equilibrium is set at an output level of Q_A at a price P_A. However this is not a socially optimum equilibrium as the society faces negative externalities depicted by the area E. A Pigouvian tax could be imposed, in order to eliminate such negative externality. This tax would decrease the output produced to Q_S, and increase price to P_S. this is a socially efficient

equilibrium where the marginal private benefit of producer equals the marginal social cost of production. Imposition of Pigouvian tax, represented by 't', increases the production cost and pushes the Producer's marginal private cost curve upwards to MPC'. Consumer surplus decreases by the area A+C+F, while producer surplus decreases by area B+D+G. Government gains a tax revenue equal to shaded area A+B+C+D. The negative externalities of productive activity are therefore removed using a Pigouvian tax, through elimination of excess production in this case. Indeed, the careful implementation of Pigouvian taxes require them to be imposed on the polluting aspect of the factory, rather than directly impose them on output levels.

Problems of Pigouvian Tax/ Criticisms

Even as policymakers have embraced Pigou's idea, however, its flaws, both theoretical and practical, have been scrutinised. Economists have picked holes in the theory. One major objection is the incompleteness of the framework, since it holds everything else in the economy fixed. The impact of a Pigouvian tax will depend on the level of competition in the market it is affecting. For example if a monopoly is already using its power to reduce supply of its products, a new tax may not do any extra good. And if a dominant drinks firm absorbs the cost of an alcohol tax rather than passes it on, then it may not influence the rowdy drinker.

Another problem is "calculation and knowledge problems", that in practice it can be difficult to measure the external costs of producing/consuming goods. For example, the external costs of driving a car include pollution, asthma, congestion, and the risk of accidents. A government cannot issue the correct Pigovian tax without knowing in advance what the most efficient outcome is. This would require knowing the precise amount of the externality cost imposed by the producer, as well as the correct price and output for the specific market. If lawmakers overestimate the external costs involved, Pigovian taxes cause more harm than good.

Another important critique of Pigou's idea came from Ronald Coase. Coase considered externalities as a problem of ill-defined property rights. If it were feasible to assign such rights properly, people could be left to bargain their way to a good solution without the need for a heavy-handed tax. The critical element is transaction cost theory, not externality theory according to him.Coase used the example of a confectioner, disturbing a quiet doctor working next door with his noisy machinery. Solving the conflict with a tax would make less sense than the two neighbours bargaining their way to a solution. The law could assign the right to be noisy to the sweet-maker, and if worthwhile, the doctor could pay him to be quiet. In most cases, the sheer hassle of haggling would render this unrealistic, but before charging in with a corrective tax, first think about which institutions and laws currently in place could fix things.

Administrative costs of implementing taxes on negative externality creating activities, like placing a congestion tax on driving in a town, can be relatively impractical. Besides there can be political reluctance on imposing of new Pigouvian taxes as the governments can face political costs. Public acceptability has also to be considered when imposing a new tax or increasing the old ones. But at other times the government's desire to raise revenue and not exactly tax externality generators could also play a role. It would be nice to believe that politicians set Pigouvian taxes merely in order to price in an externality, but the evidence, and common sense, suggests otherwise. Mere desire to boost tax revenue can lead to over-taxation of externality generating activities over the period of time.

A tax on good can create an incentive to find illegal methods. For example, a tax on rubbish may be justified due to external costs. However, this may lead to illegal fly-tipping because consumers find a way to avoid the tax. This could create a bigger problem than the external costs of legal rubbish disposal.