

PJC 2017 H2 Prelim Exam Paper 2

Question 3:

The biggest four airlines in America now control 80% of the market. The US Environmental Protection Agency (EPA) has said that greenhouse gases from aircraft endanger human health. Many people in the USA are calling for the use of carbon taxes rather than tradable permits to reduce greenhouse gas emissions.

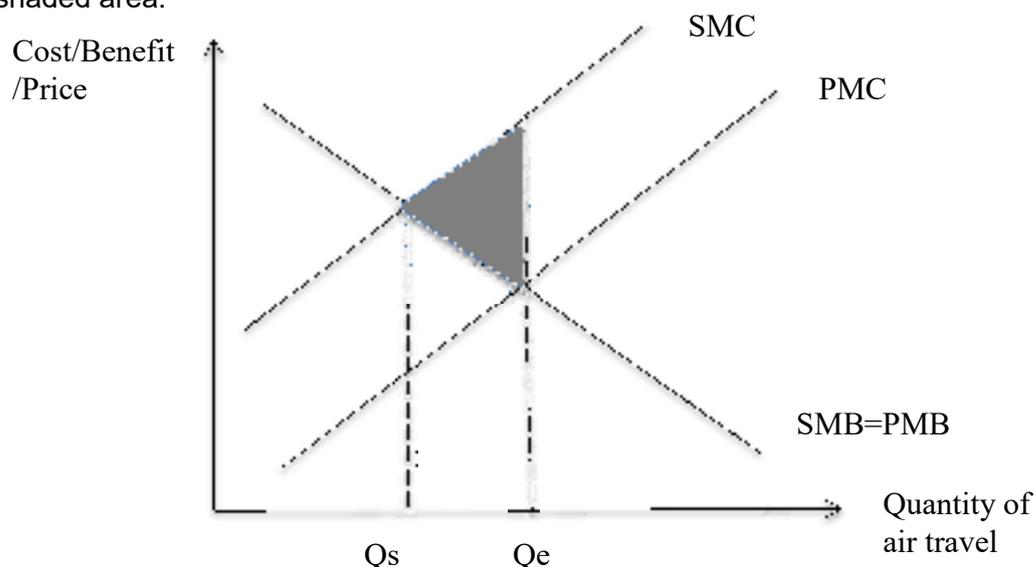
a) Explain how negative externality and market dominance can lead to market failure. [10]

Market failure occurs when the free market fails to achieve economic efficiency without government intervention. Allocative efficiency is achieved where Price (P) is equal to Marginal Cost (MC). Market failure could occur due to the presence of negative externalities and market dominance.

The presence of negative externality can lead to market failure.

Negative externalities are costs borne by third parties who are not involved in the production or consumption of the good and they are not compensated for. In the air travel market, the Private Marginal Benefit (PMB) of airlines/producers is the additional revenue they get from the provision of air travel services. The Private Marginal Cost (PMC) borne by the airlines are the fuel and manpower costs of operating a flight. In the free market, airlines decide to produce at Q_e where $PMB=PMC$ to maximize their welfare. Assuming no positive externalities, $EMB=0$ hence $PMB=SMB$ (Social Marginal Benefit). Negative externalities arise as the provision of air travel services lead to the emission of greenhouse gases, which according to US Environmental Protection Agency (EPA), the emissions endanger human health. Thus residents living near the airport who are the third parties may suffer health problems, such as increased risk of respiratory problems as a result of prolonged exposure to carbon emissions from aircraft. This increased health costs which are third party costs are not compensated for. These External Marginal Costs (EMC) cause a divergence between Social Marginal Costs (SMC) and PMC by a distance of EMC since $SMC=PMC+EMC$.

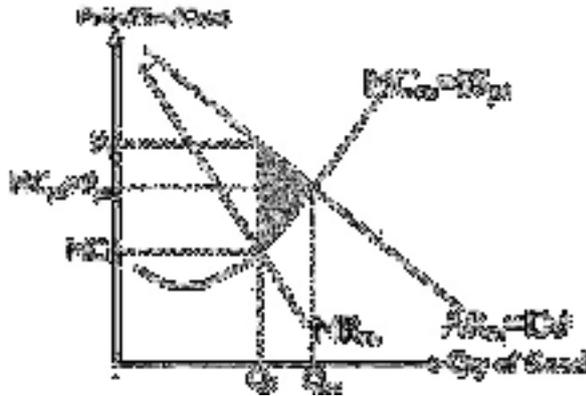
The socially optimum level occurs when the additional cost to society is equal to the additional benefit to society where $SMC=SMB$ for the last unit of air travel service produced at Q_s . Since Q_e is greater than Q_s , there is an over-production of air travel services in the free market. For every additional unit produced between Q_s and Q_e , $SMC>SMB$, causing a deadweight loss to society of the shaded area.



Thus, negative externalities cause welfare loss and economic inefficiency. Hence negative externalities cause market failure.

Market dominance is another source of market failure as it results in allocative inefficiency. The four airlines in America control 80% of the market. The air travel industry in US exists in an oligopolistic market structure. Oligopolistic firms have high barriers to entry and thus high market power and are able to restrict output and set price higher than marginal cost causing market failure due to allocative inefficiency.

With only four airlines providing for most of the air travel services in US, there are few substitutes to consumers, making the demand for their air travel services to be price inelastic. With a downward sloping demand curve, they seek to maximize profits and will set output where $MC_m = MR_m$ at Q_1 . Price, P_1 exceeds marginal cost, MC_1 . Consumers value an additional unit of the air travel service more than its marginal cost and welfare can be maximized by increasing output to Q_{pc} and lowering price to P_{pc} , which are the output and price levels of a perfectly competitive market structure. At P_{pc} , price is equal to marginal cost and thus allocative efficiency is achieved. By producing at Q_1 and P_1 , deadweight loss of the shaded area is incurred, resulting in market failure.



In addition, if the airlines are in a collusive oligopoly, they collude and agree to restrict output and raise prices. They would be behaving like a monopolist in the market, setting prices to maximize profit and the impact on equilibrium price and output leads to allocative inefficiency and this is can also be shown by the same diagram above.

Market dominance results in allocative inefficiency and thus causes market failure.

Negative externalities and market dominance are sources of market failure in the US air travel market. The US government needs to correct the market failure and the policy responses will be discussed in (b).

b) Discuss the alternative policies to tackle the above sources of market failure. [15]

The sources of market failure in the US air travel market are negative externality and market dominance. The policy responses can include the use of tradable permits, carbon tax and also antitrust policies.

One of the policies to correct market failure due to negative externality is the use of tradable permits.

The implementation of tradable permit is where a maximum permitted level of emissions is set for a country and the government distributes permits to various industries in the economy, allowing them emit up to a specified amount of carbon. US government can consider implementing this policy and distribute permits to the airline industry. It allows airline industry to trade with the other industries on carbon emissions.

Airlines that use more efficient methods of production will emit less greenhouse gases and hence the EMC in production is lowered, resulting in the divergence between SMC and PMC to be reduced. Q_s rises and deadweight loss is reduced. These 'greener airlines' can sell the permits to other airlines/firms in other industries who may need to emit more carbon emissions in their production. For firms that are unable to reduce their level of emissions will have to buy permits to pollute. These firms pay for permits to pollute will thus face higher marginal cost of production as they need to buy emissions permits to produce additional output. PMC rises to PMC_2 and Q_2 falls (Q_2 closer to Q_s).

There are however limitations to the use of tradable permits. The US government faces administrative costs as they still needs to monitor and measure the amount of greenhouse gas emissions each firm emits when producing their goods and services. It is also administratively complex as the amount of carbon emissions due to flying is not easy to estimate.

It is also important to note that the use of tradable permits in the US air travel market may result in unintended consequences. This is so as the US air travel market is dominated by a few large airlines, meaning the airlines could potentially exercise their market power in the permit market to create distortions in output level. For example, an airline could buy up all or most of the permits to push up permit price so as to increase the cost of production for their competitors, either to drive them out of the market or to reduce the market share of their competitors. Such unintended consequences must be addressed if tradable permits are to be used in the US air travel market.

Tradable permit is one policy that can be implemented to tackle the market failure caused by negative externality.

One of the policies to correct market failure due to negative externality is the use of taxation.

Carbon tax can help reduce emissions. With pollution monitoring equipment, the government can impose a tax on airlines, according to how much greenhouse gas they emit. The higher the emissions, the higher the tax. This similarly shifts PMC up to PMC_2 as firms face higher costs of production when they need to pay an additional carbon tax. They reduce production to Q_2 and hence less carbon emissions.

Because of imperfect knowledge, governments may not set the correct amount of carbon tax equal to EMC. Furthermore, carbon emissions due to flying are not easy to estimate. Too low a tax and the output remains too high. Too high a tax leads to underproduction and airlines may need to raise prices of their air travel services, lowering consumer welfare.

However, carbon tax may still be a better policy than tradable permits because it avoids the unintended consequences caused by tradable permits. Regardless of the market power of airlines; they have to pay the carbon tax based on their emission levels. This could also be the reason why many people are calling for the use of carbon taxes instead of tradable permits to reduce the emissions.

Carbon tax is one policy that can be implemented to tackle the market failure caused by negative externality.

One of the policies to correct market failure due to market dominance is the use of antitrust policy.

The US government regulates market dominance via the US Department of Justice (DOJ) Antitrust Division. The DOJ monitors companies pricing behavior and if they discover evidences of anti-competitive behavior such as price fixing or collusion the DOJ will fine the firms involved or to forbid future anticompetitive behavior and require the firms to take steps to remedy the anticompetitive effects of past violations.

DOJ could look into the US airline industry, especially since there are only four major airlines controlling 80% of the market, which makes it easier for these four airlines to agree not to compete head to head. If the four airlines are competing unfairly, such as raising prices together, DOJ should intervene to stop such practices as such pricing behaviour penalizes the consumers. DOJ should also stand ready to block mergers, to prevent airlines from building monopoly positions at airports.

Such interventions by DOJ will encourage greater competition in the US air travel market, reducing allocative inefficiency as prices would be lowered to be closer to MC.

Antitrust policies are not without limitations. One important one is that it is often difficult to identify whether rising prices in the market is due to firms abusing their market power or due to rising costs. Furthermore, it is costly to run such regulatory body as such organizations require lawyers and economists to put together lawsuits against large corporations.

Another policy to correct market failure due to market dominance is the use of MC pricing. The US government could regulate that airline must set price at $P = MC$. Firm produces where MC intersects AR. Quantity is higher and price is lower than profit maximizing price and output. Consumers are better off as they could enjoy air travel at lower prices. There is allocative efficiency and society's welfare is maximized.

However, such policy is only sustainable if airline is still able to make normal or supernormal profits when $P=MC$.

Tradable permits, carbon tax and antitrust policies are the policies to tackle the two sources of market failure. For tradable permits to work effectively, antitrust regulatory bodies must also be able to ensure the permit market is not used as a tool to build airline's monopoly position. Only if this can be addressed will tradable permits be a good policy to implement for the US air travel market. Otherwise, carbon tax and antitrust policies should complement each other to solve the market failure caused by negative externality and market dominance respectively.