# Explain why the market might under-produce a good which generates a positive externality. What might be appropriate policy interventions?

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[1]An externality is an effect of a purchase or use decision by one set of parties on others who did not have a choice and whose interests were not taken into account. Externalities can affect the economy in various ways and are subject to the good or service that is being produced or consumed in the economy. Many goods and services in the economy have positive externalities attached to them, this is means that the consumption of the good has a greater social benefit then it does private benefit to the consumer the significance of this being that the individual who consumes the good is unable to enjoy the maximum utility of the good or service. This essay will discuss and evaluate why under a free market such goods are under produced and in what circumstances can the government intervene so that goods are produced and consumed at a socially optimum level.

Positive externalities are normally associated with public goods in the economy. Public goods are indentified by their distinct characteristic of non-excludability; the connotation of this term is that the consumption of goods cannot be restricted to just individuals that have paid for the good and others who haven't paid can also enjoy the utility of the good. Positive externalities are directly linked to such goods due to the fact that they are beneficial to the economy therefore the spill over effects of the consumption of such goods has positive social implications.

However if such goods are so beneficial to the economy why are they under produced and consumed in a free market economy? One reason for this relates back to if a good is non-excludable as then the issue of the free rider arises. [2]"Free riders are actors who take more than their fair share of the benefits or do not shoulder their fair share of the costs of their use of a resource". Meaning that consumers can take advantage of a good without directly contributing to its production. An example of this is Pay-Per-View broadcasting. Lets imagine one individual buys the sporting event they will enjoy the maximum utility for the good, however if a friend of theirs then comes to watch the event with them, the friend also receives the exact same utility from the good without paying for it essentially taking a 'free ride'. This can provide an explanation into why public goods are under produced in a free market economy. Private firms

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[1] http://economics.about.com/cs/economicsglossary/g/externality.htm
[2] http://www.economyprofessor.com/economictheories/free-rider-problem.php

primary objective is turn over a profit, but if a free rider problem persists where their good is being consumed without receiving the required revenue for it then it doesn't become feasible for a firm to continue producing such a good as it is unprofitable.

The most obvious solution to tackle the matter of free riders is for the government to provide such public goods and for it to be financed via taxation. As it is extremely difficult for individuals and firms to evade tax in the economy this substantially reduces the free rider problem among public goods. Services such as the NHS are paid for through the tax payer and because this is the case every individual that uses the service when in need has contributed to it.

However many may argue that the production of public goods by the government leads to a 'forced-rider problem'. The reasoning for this lies behind the assumption that the government supply public goods that are in their best interests rather than societies and by financing such projects through the tax payer the public are supporting goods that in the free market they wouldn't resulting to inefficiency and Government failure.

Another reason why goods that generate positive externalities are under produced in the economy is because rational firms and consumers are unaware of the social benefits of the good.
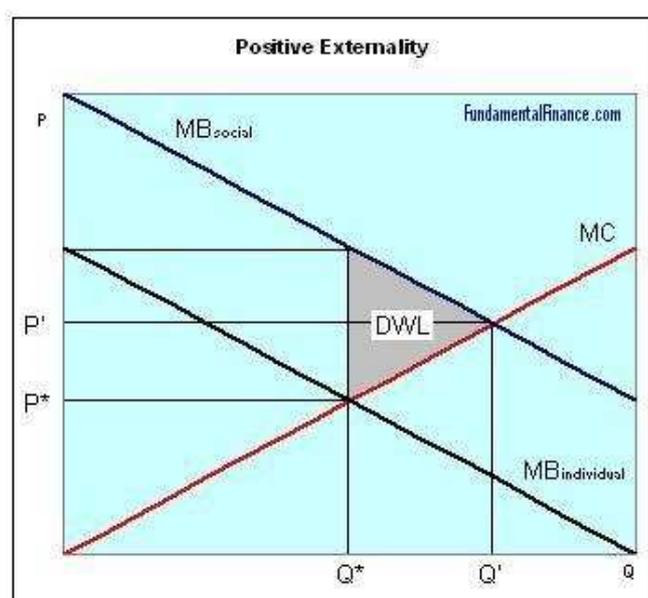


The diagram above illustrates the Marginal benefit and Marginal cost curves for a good that provides a positive

externality. Due to the externality the Marginal social benefits (MB social) is to the right of marginal private benefits (MB individual) representing a greater benefit. As consumers are rational and can only take into account their own private benefit and therefore pay price P* and receive Q*. This isn't the socially optimal level of output as the marginal benefit to society is still much higher than the marginal cost to society meaning that there is still room for an increase in output, this is because we know that the most efficient and profitable level of output occurs when total marginal benefit equals to total marginal cost. But because individuals do not take this into consideration, consumption stays at Q* resulting in the under production of the good and dead weight loss.

A policy that the government can implement to boost the consumption of such goods is to subsidise it. This would allow for an increase in the private marginal benefit an individual receives when consuming a good. This leads to a shift in the Marginal private benefit curve to the right increasing consumption, output and the allocate efficiency of the good reducing deadweight loss. However, to internalise the externality the government needs to subsidise the exact amount of the externality which can be an extremely difficult task for the government. Many positive externalises are of which that improve social welfare and happiness and cannot be valued by any monetary figure, thus subsidising such goods would seem an impossible task and the incorrect amount of subsidy would lead to government failure.

In conclusion it can be said that goods that generate positive externalities are under produced in the free market due to the fact that they are undervalued by both consumers and firms in the economy. This is a direct result of rational consuming and producing in the market and although it leads to a loss in allocative efficiency the equilibrium at which such goods are bought and sold at is seen to be at the most productivity efficient level. Government intervention policies can save the market from failure, but this may also be subject to government failure. If the government lay out policies catering to self interest or based on imperfect information they will fail to internalise the externality resulting in a possible loss of social efficiency.

## Bibliography

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http://www.economyprofessor.com/economictheories/free-rider-problem.php

http://economics.fundamentalfinance.com/positive-externality.php

**Many stores make some form of "Price Match" promise to their customers. How might game theory help us to understand why they do this?**

**Benton knight**

In a market without collusion, firms aggressively compete with one another until price equals marginal cost and profit is equal to zero. The prisoner's dilemma game below demonstrates how this may occur.

|  | | Firm B | |
|---|---|---|---|
|  |  | **High Prices** | **Low Prices** |
| **Firm A** | **High Prices** | 3,3 | 1,4 |
|  | **Low Prices** | 4,1 | 2,2 |

Bertrand-Nash Equilibrium (pointing to 2,2)
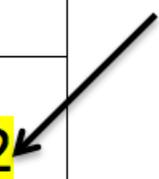
For simplicity I will assume that firms have a choice between high and low pricing. If they charge high prices they will share a monopoly profit, and low prices will yield zero/normal profit. The above matrix-type diagram shows that both Firm A and B have a strictly dominant strategy to set prices at the lower level. Each firm's best response is low prices because they each receive a higher payoff by charging low prices, irrelevant of the other firm's strategy. Therefore the Bertrand-Nash Equilibrium is found where both firms charge low prices, with each receiving a payoff of 2. This is not a Pareto efficient outcome.

As long as the firms know the number of periods in a game, they will continue to defect again and again by charging low prices. Only when the game is the played an infinite number of times and firms value their future sufficiently high enough, is there a possibility for firms to conform to achieve a Pareto optimal outcome.

In the real world, firms are unaware of when competition with other firms will end (games are played an infinite number of times). It is possible for firms to collude in order to achieve high prices and a share of monopoly profits. Referring to the above game they could each achieve a payoff of 3, which is higher than the Bertrand-Nash Equilibrium. However, once an agreement has been made there is a high incentive for either firm to deviate from their agreement by pricing marginally below their competitor. In this case, the deviator would capture the entire market and almost the full monopoly profits.

It could be argued that firms have created a method of charging high prices without the risk of being undercut by competitors. This is a "Price Match" promise. A Price Match promise involves one firm

promising to match another firm's price, should it be lower. So if one firm deviates from an agreement to collude and charge high prices, by cutting their prices, the other firm will punish them by charging low prices forevermore. Firms can confidently charge high prices, as their competitors have no incentive to deviate. Using my previously example, if firm A were to lower its prices, firm B would instantly match the new price. Neither party would benefit by a reduction in prices, therefore the Price Match promise is a credible enough threat to remove any risk of price competition. This is clearly undesirable for consumers.

Some firms have developed the Price Match promise further, offering to refund more than the difference when matching a competitor's price. This is often called a Price Match Plus. PC World state, "We'll not only match the price but also beat it by 10% of the difference."[3] If firms have colluded agreeing on a set price, one firm could undercut their competitor without lowering their price. To do so they advertise their prices above the agreed amount, then by conducting a Price Match Plus, refund the difference plus an extra amount making the new price lower than agreed.

With many firms offering similar products, it may be hard to believe that all firms offering Price Match policies are involved in some form of collusion. It could be used as a marketing tool, encouraging consumers to buy with confidence. Many firms offer a time period after purchase for consumers to seek a lower price and receive the difference refunded. A famous example being John Lewis, who offer a 28-day time period[4]. As long as collusion is not occurring, a Price Match can be beneficial to consumers, in particular those with high searching costs. They can confidently make a purchase from a firm offering a Price Match, as it is possible to search for a lower price at a more convenient time.

To conclude, game theory demonstrates how firms can sustain collusion by offering a "Price Match" promise to their customers. This is undesirable for consumers, as consumer welfare is lost with a price maintained well above the market equilibrium level. However if collusion is not evident, it may be an innocent marketing tool used to increase brand loyalty. In this case, consumers can make a purchase with the confidence that they are receiving a good deal.

**Word Count:** 748

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