Chapter 1

Public Goods and Externalities

1.1 Introduction

1.1.1 Aims

1. Recall the two dimensions of public good (rivalry and excludability) and understand how they lead to market failure
2. Identify and describe the occurence and results of positive and negative externalities
3. Understand the role of the public sector in managing market failures arising from public goods and externalities
4. Be aware of the particular challenges related to climate externalities
5. Become familiar with the dimensions of the environmental ceiling and social foundations of the doughnut economic model

1.1.2 Market equilbirium

Market equilibirium occurs when supply equals demand. Private marginal benefit of consumption is equal to private marginal cost of production.

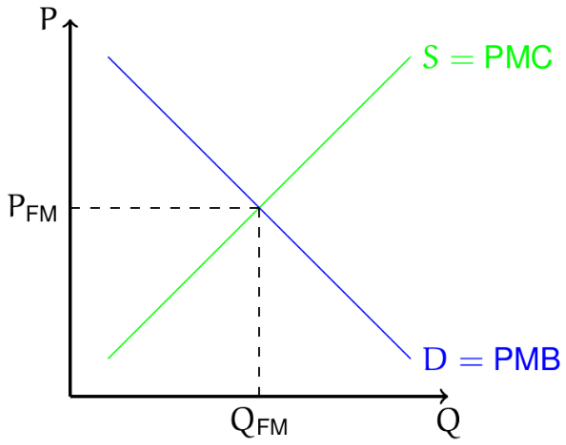

Figure 1.1: Market equilibrium.

1.1.3 Public goods and externalities

Definitions

Public goods:

> Goods which are both non-excludable and have non rivalrous consumption.

Externalities:

> Positive or negative effects on third parties arising from the production or consumption of goods, that are not reflected in the price

Market failures

Public goods and externalities cause market failures in the allocation of goods/services at the free-market equilbirium.

- i.e. $Q_{\text{free-market}}$ is not optimal
- addressed through the allocative role of government

1.2 Public goods

1.2.1 Two dimensions of public good

Excludability: the degree to which access to a good, service or resource can be restricted.

- **Excludable:** agents can easily be prevents from using the good/service
- **Non-excludable:** preventing agents from consuming the good/service is impossible (or very expensive)

Rivalry: the degree of which consumption by one party affects another parties use of the good.

- **Rivalrous:** consumption by one agent prevents simultaneous consumption by other agents, or reduces the marginal benefit of another agents
- **Non-rivalrous:** once it is provided, the additional resource cost of another person consuming the good is zero (i.e. MC = 0) and the marginal benefit does not decrease with number of users
- (**Anti-rivalrous:** marginal benefit increases with the number of users, e.g. social network)

1.2.2 Rivalry and capacity

Goods are often non-rivalrous up to a certain capacity, above which they are rivalrous e.g. public transport (bus/train), road bridge, internet bandwith.

1.2.3 Continuous scale

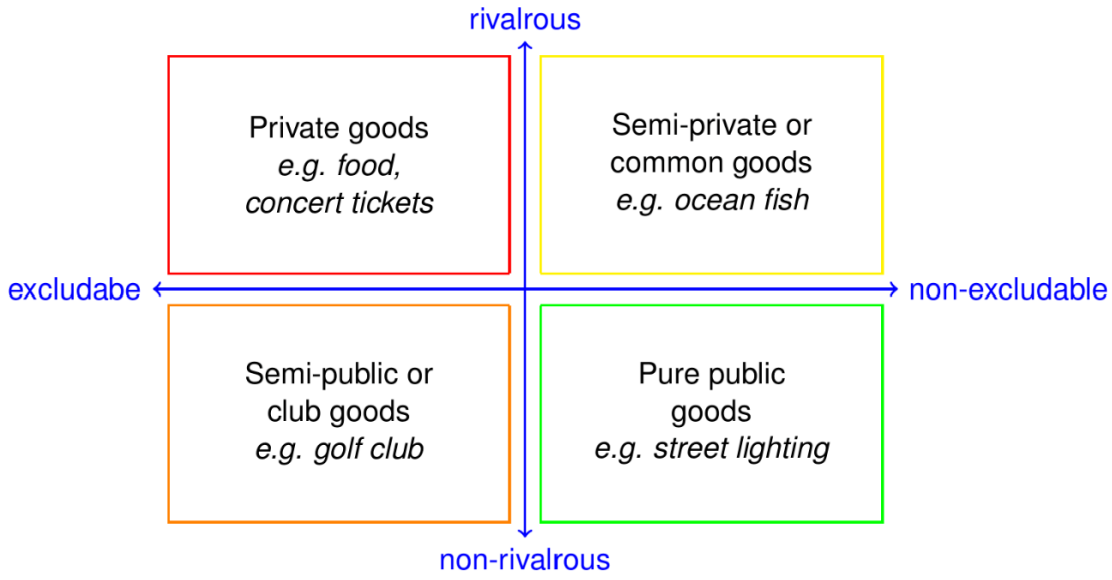

Figure 1.2: Continuous scale.

1.2.4 Public goods in free markets

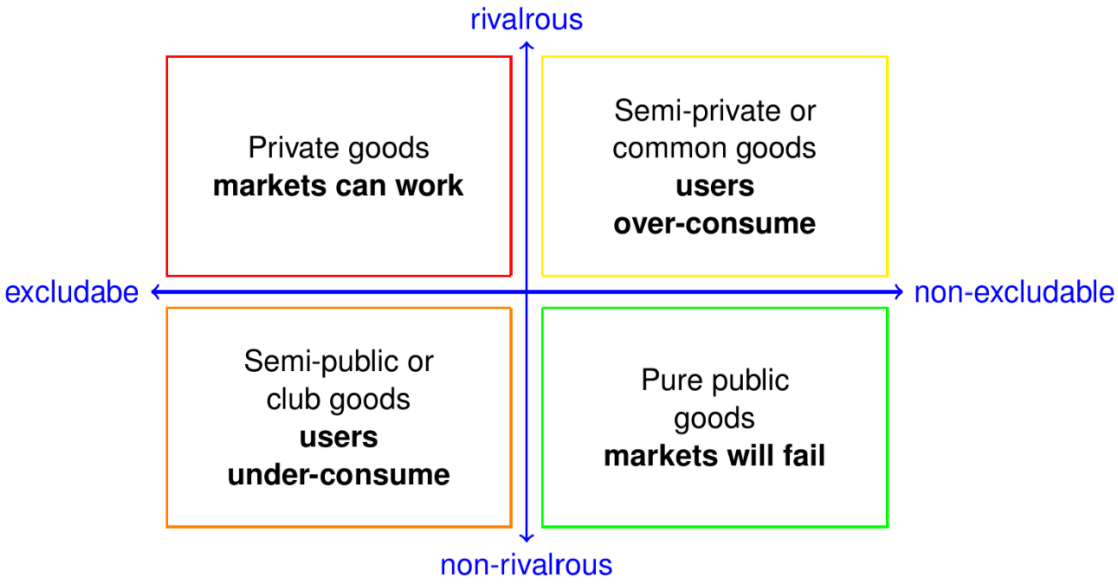

Figure 1.3: Public goods in free markets.

1.2.5 Public goods and market failure

Pure public goods are **non-excludable**

- Producers cannot exclude agents from consumption
- Unable to charge and therefore make profit

- Therefore (in theory) would not be produced through market action!

Possibility of funding via private cooperative, but...
Free rider problem

> as size of cooperative increases, possibility of avoiding contributing increases

Public sector provision

Large group public goods supplied from public sector budget

- Allocative role of government

1.2.6 Privatisation in the public sector

Note... Public sector provision $\neq$ equivalent public sector production.

> The creation of markets in public services has been one of the great defining shifts in the way government has been run over the past 30 years (Gash and Roos 2012)

1.3 Externalities

1.3.1 Positive and negative externalities

Externalities

> when the actions of one economic agent directly affect other agent(s) outside the market mechanism (production/consumption)

Externalities can arise from either production or consumption and have a net positive or negative effect.

1.3.2 Negative production externality

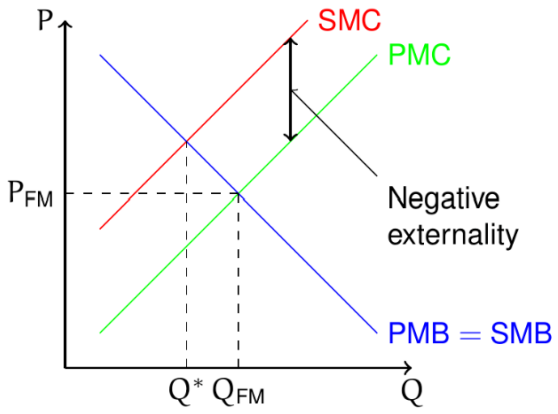

Figure 1.4: Negative production externality.

Production of output reduces well-being of third parties not involved in transaction,

- e.g. oil spills during fuel production pollute oceans and damage wildlife
- leads to overproduction

1.3.3 Negative consumption externality

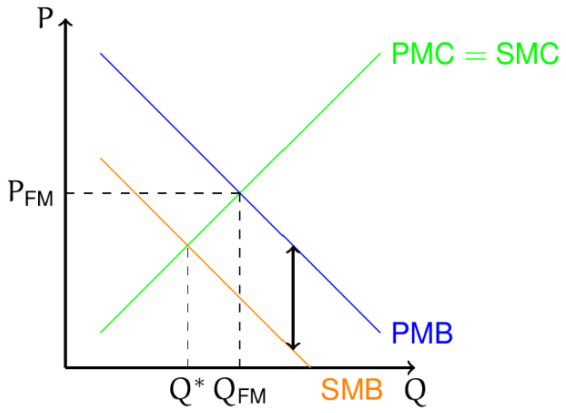

Figure 1.5: Negative consumption externality.

Consumption of output reduces well-being of third parties not involved in transaction,

- e.g. driving cars produces carbon emissions
- leads to overconsumption

1.3.4 Positive production externality

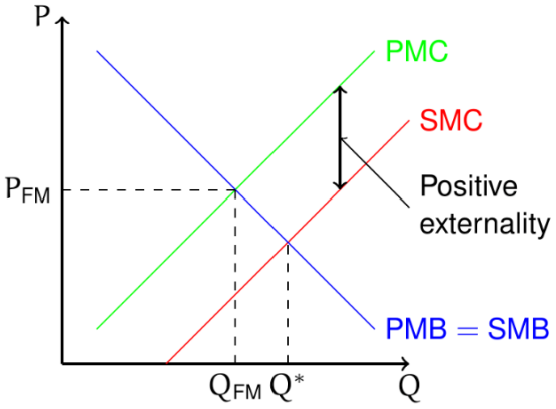

Figure 1.6: Positive production externality.

Production of output reduces well-being of third parties not involved in transaction,

- e.g. creating a new tourist attraction brings increases custom to local shops
- leads to underproduction

1.3.5 Positive consumption externality

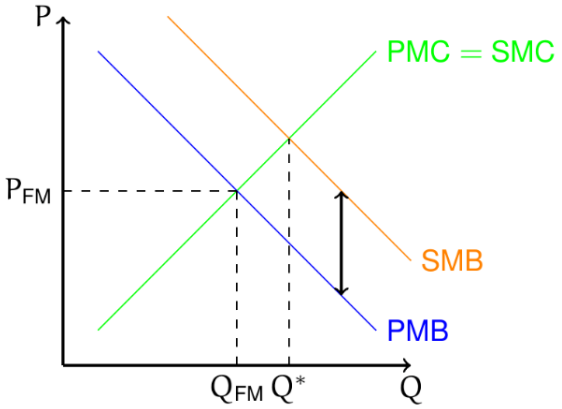

Figure 1.7: Positive consumption externality.

Consumption of output reduces well-being of third parties not involved in transaction,

- e.g. cycling improves peoples general health, rducing pressure on public healthcare
- leads to underconsumption

1.3.6 Externalities and property rights

Externalities can be transferred where third party benefit/cost is clear i.e. where property rights are well defined.

1.3.7 Managing externalities

Where property rights are not clear, managing externalities relies on allocative role of government

Public sector interventions

Negative externalities:

- Corrective taxes
- Quantity restrictions
- Standards

Positive externalities

- Subsidies
- Tax benefits
- Direct production

1.3.8 Externalities and the environment

Note... Externalities related to climate change are critical to long term sustainability of the planet.

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> "Climate change is the single benefit health treat facing humanity. While no one is safe from the health impacts of climate change, they are disproportionality felt by the most vulnerable and disadvantaged." (World Health Organisation 2021)

1.3.9 The doughnut economic model

Figure 1.8: Doughnut economic model.