External Effects I

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What are External Effects?

- External effects are impacts on consumer and investment activities on un-involved third parties.
- In doing so, the perpetrators do not feel the (positive and negative) impacts of their activities, neither directly nor by the price.
- The price, therefore, does not mirror the general shortage. Resource allocation is inefficient.

Positive and negative external effects

- When third-parties are negatively affected by external effects, this is known as negative external effects or external costs.

- When the external effect has a positive impact on a third-party, this is called a positive external effect or external benefit.

Example: Why does the self-monitoring mechanism not function with environmental protection?

Not all costs flow into the calculation of the business entrepreneur:

Nearby residents suffer from the external costs of production: There is too much demand or too much is produced.

More Examples of External Effects

- Fireworks are set off
- Passive smoke
- CO_2 emissions from a business contribute to climate change
- Restauration of historic buildings
- Vaccinations

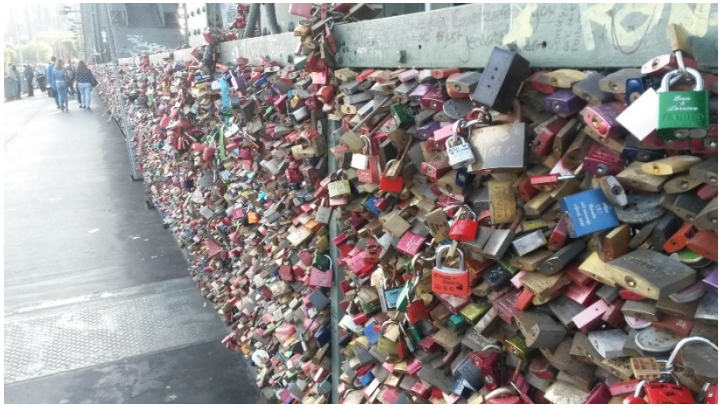
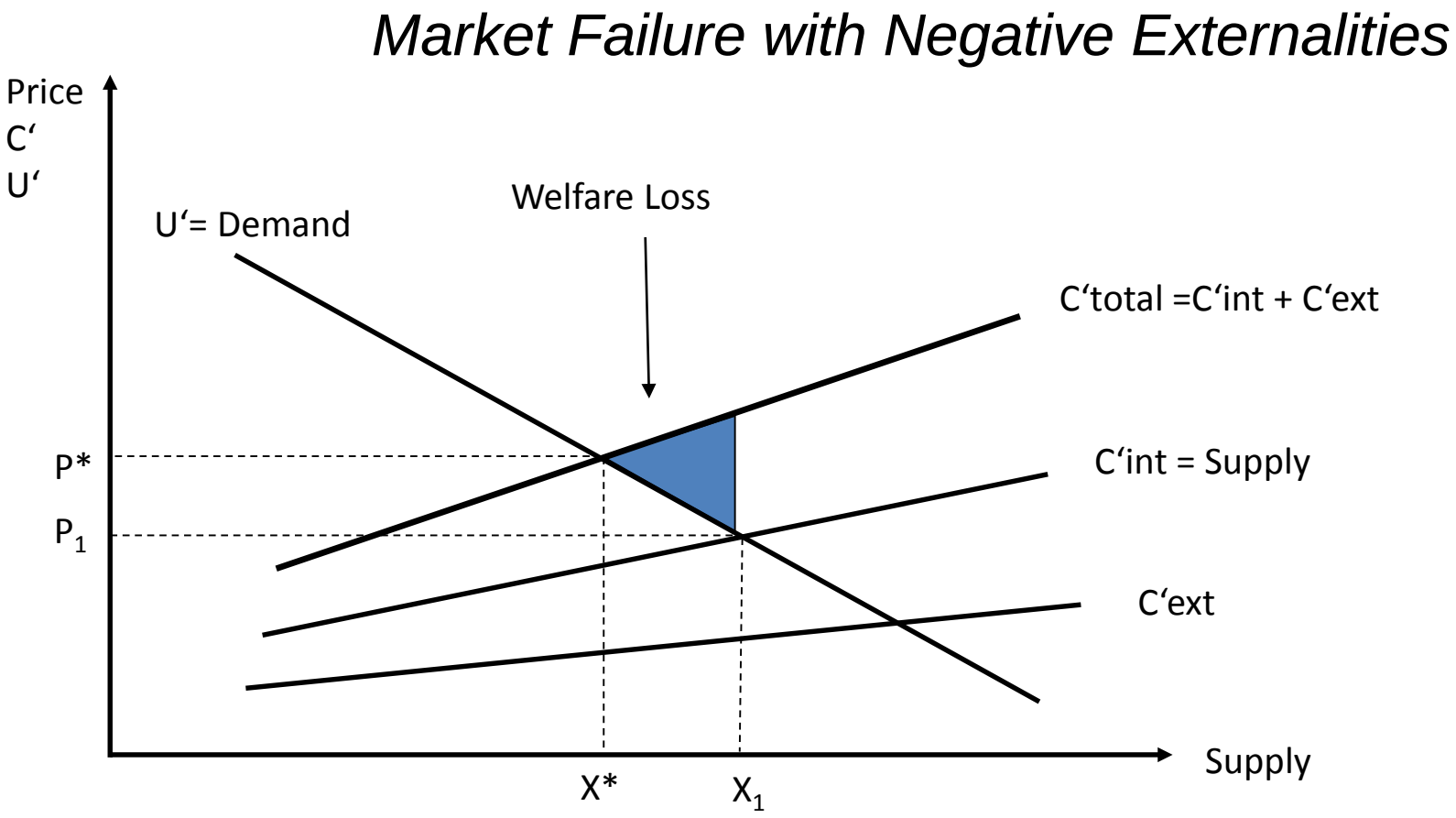


Foto: Allinger

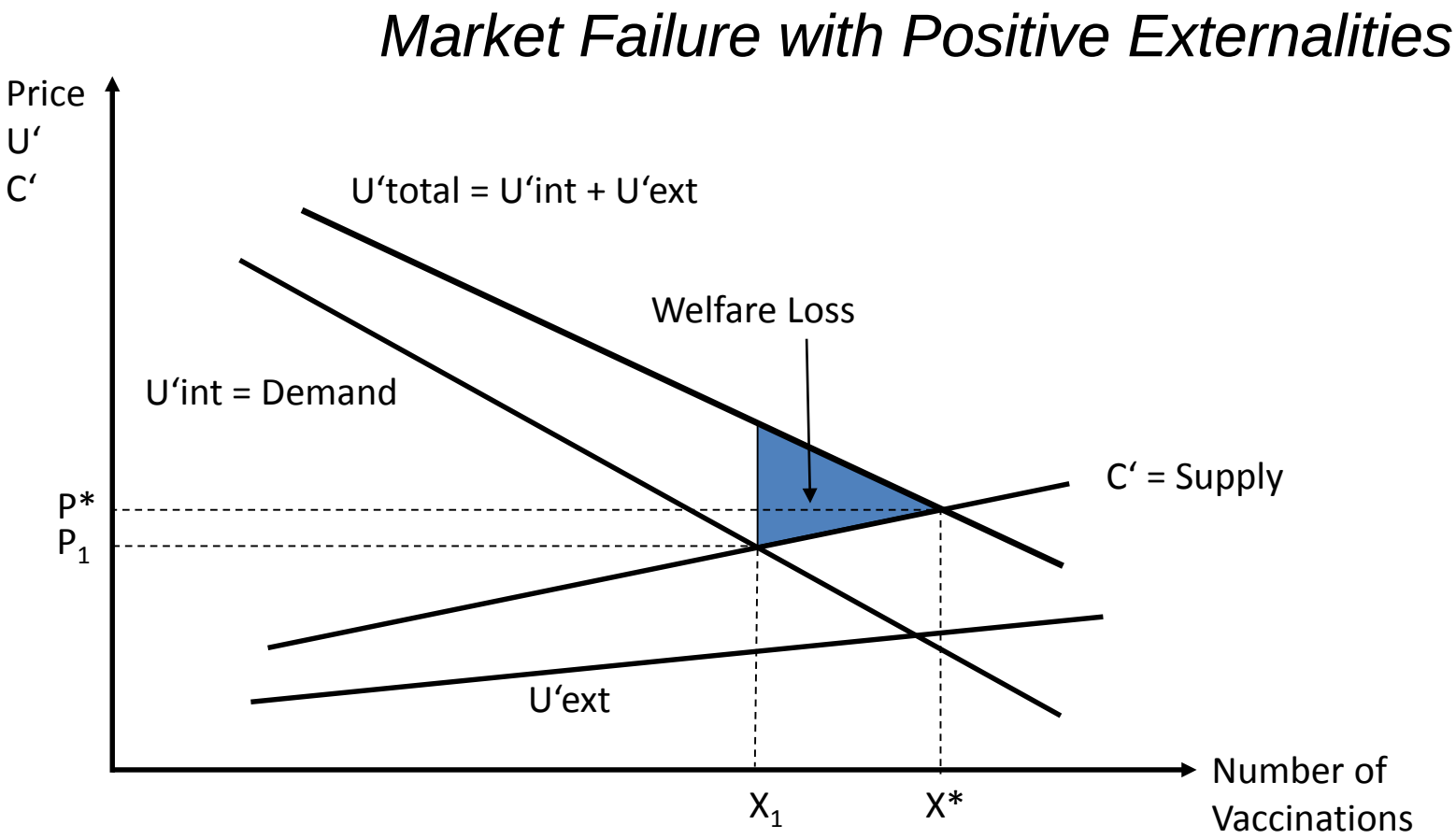
External Effects Lead to Market Failure.



Market Failure with Negative External Effects

- The social or welfare marginal costs correspond to the total sum of private (internal) marginal costs of the producer and external marginal costs of a third-party.
- The intersection of demand curve with the curve of welfare marginal costs determines optimal welfare.
- Market equilibrium, on the other hand, lies at the point where the demand curve cuts across the internal marginal cost curve.
- With negative externalities, the optimal total social welfare production supply is less in market equilibrium; with positive externalities it is higher.

External Effects Lead to Market Failure.



Alternative Graphical Illustrations of Externalities

- external benefits can be shown both as positive U‘ext or as negative C‘ext; external costs are shown as negative U‘ext or as positive C‘ext
- Different graphically illustrations lead to the same result when it comes to optimal quantity x*.
- Intuitively obvious is the illustration shown here with external benefits as U‘ext and external costs as C‘ext

Internalization External Effects

The optimal height of an externality is almost always not zero!

- The aim must be to make perpetrators feel the external effects of their actions so they take these into consideration.
- Externalities are led to an allocative optimal measure when the decision-making of the perpetrator can be changed in such a way so that perpetrators alter their actions in their own best interest and in this way reach an allocative optimal solution.

Possibilities to Correct Market Results

Perpetrators can be made to feel the external effects by the following means:

- through information
- through appeals
- through state offer
- through tax or subsidy
- through prohibitions or requirements
- through negotiations
- through certificated trade

Which Form of Correction is the Most Suitable?

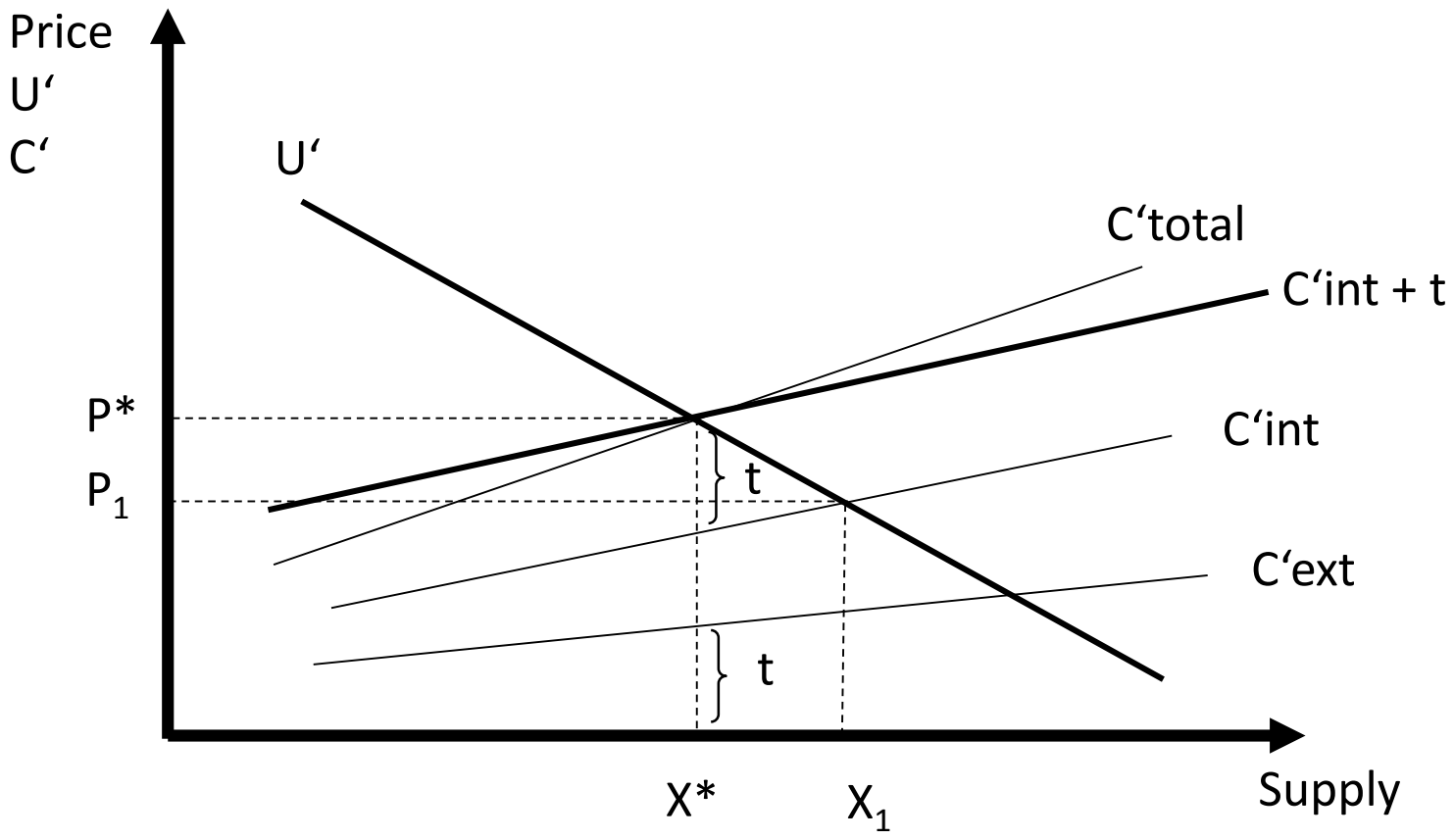
Criteria to Assess State Intervention are:

- Political enforceability (majorities, acceptance)
- Implementation costs
- Distributive impact
- Possibility of circumvention
- Static efficiency (cost-benefit analysis)
- Dynamic efficiency (incentive effects)

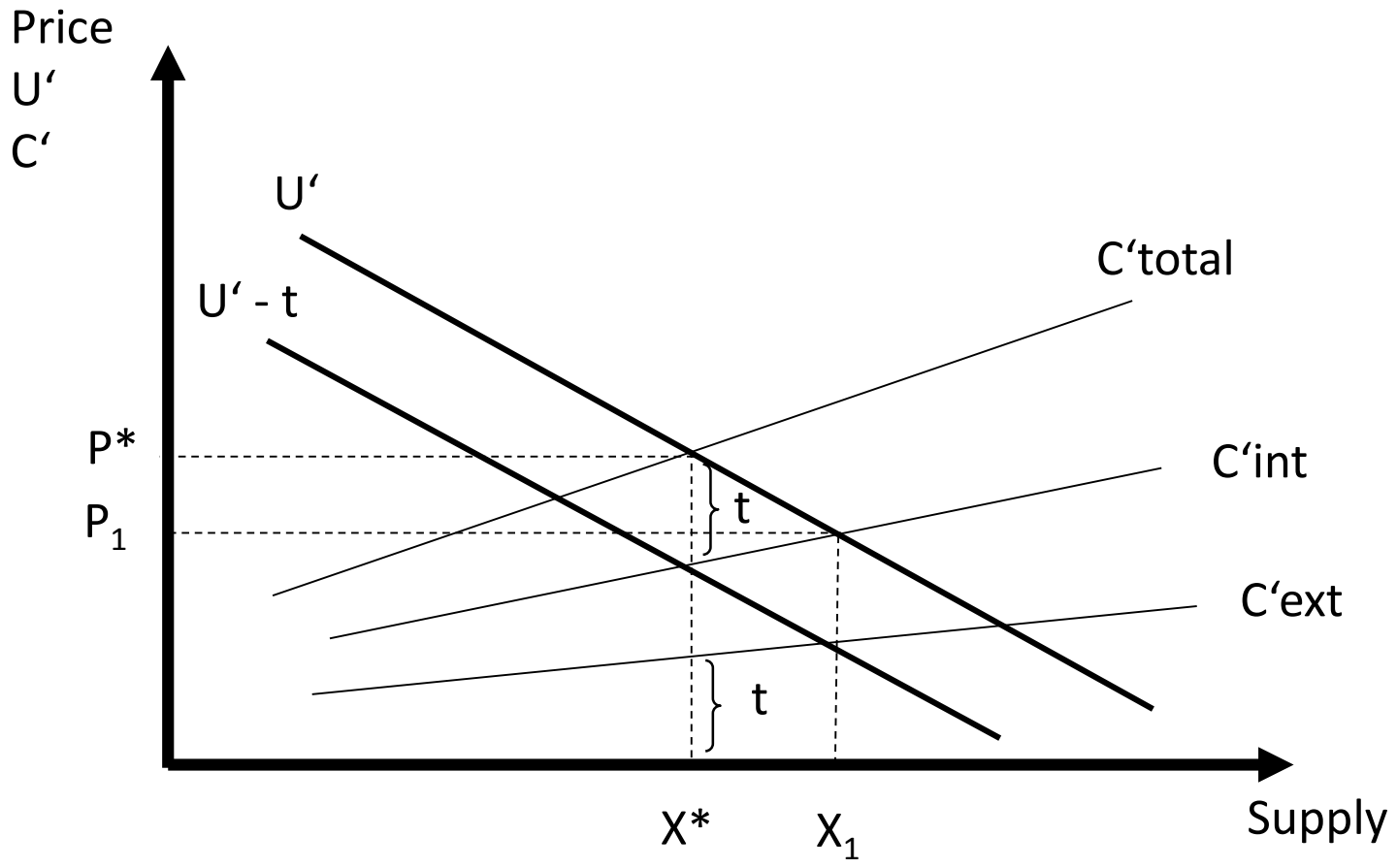
Internalizing Negative External Effects with a Pigouvian Tax

- Negative externalities can be internalized when each unit that is produced is made more expensive by a tax.
- With optimal internalization taxation (Pigouvian Tax), the perpetrator is taxed in such a way that in an optimal allocation, the social and private costs are equally high.
- The amount of Pigouvian Tax must correspond to the amount of optimal externality.

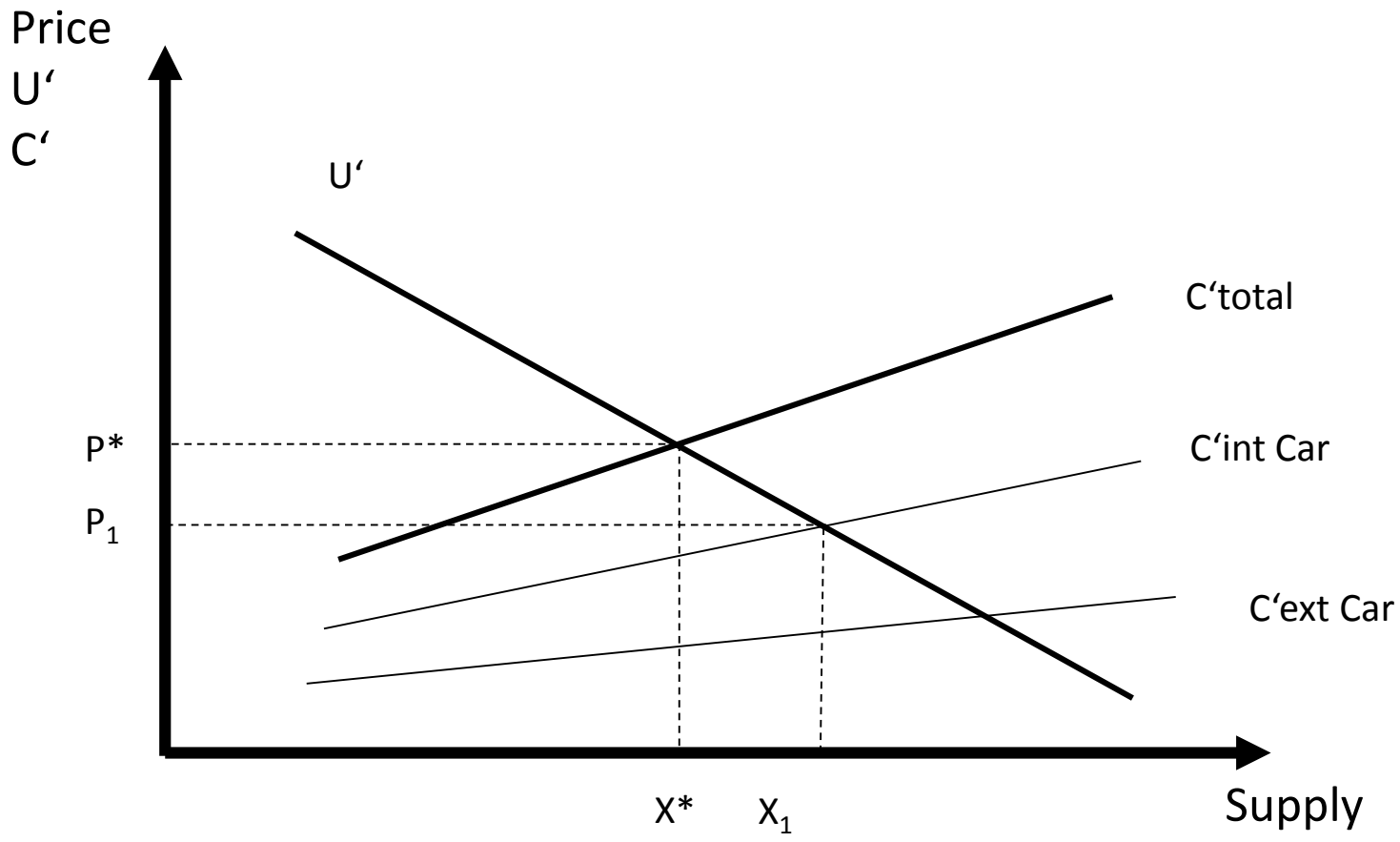
Internalizing negative external effects with a Pigouvian Tax



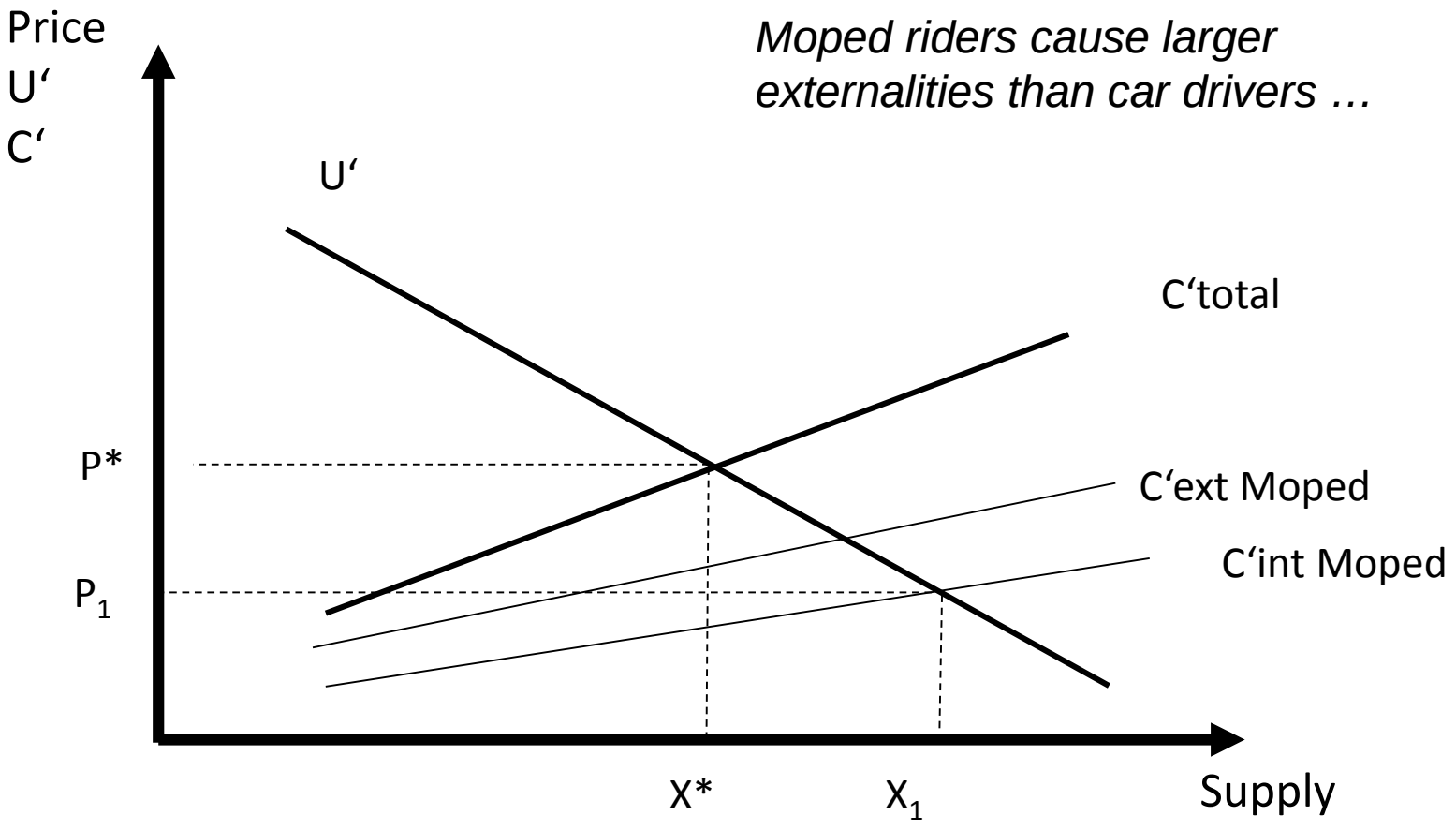
A Pigouvian Tax of the Consumer leads to the Same Result of Allocative Efficiency



Example: External Effects of Driving a Car

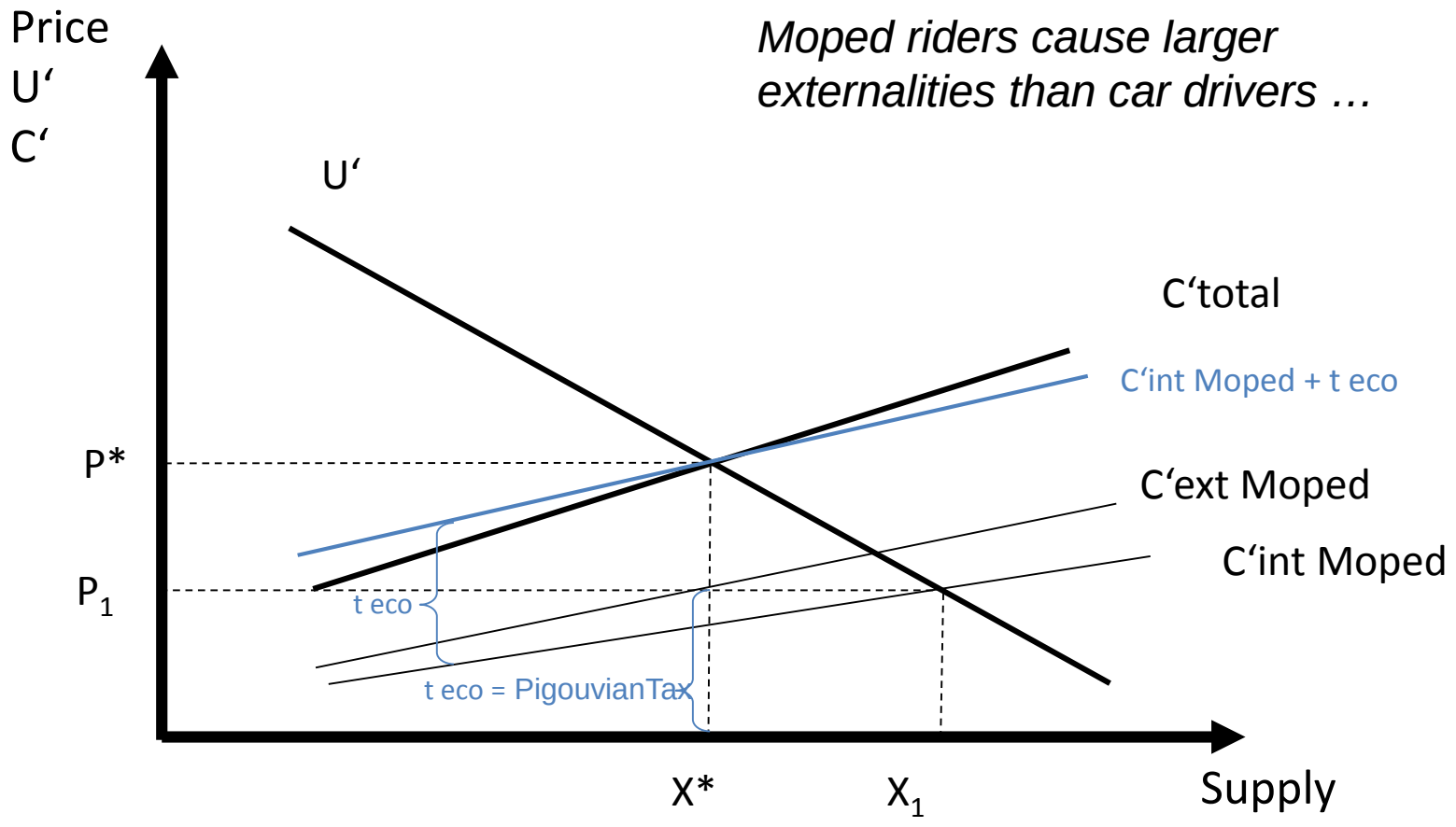


Example: External Effects of Moped Riders

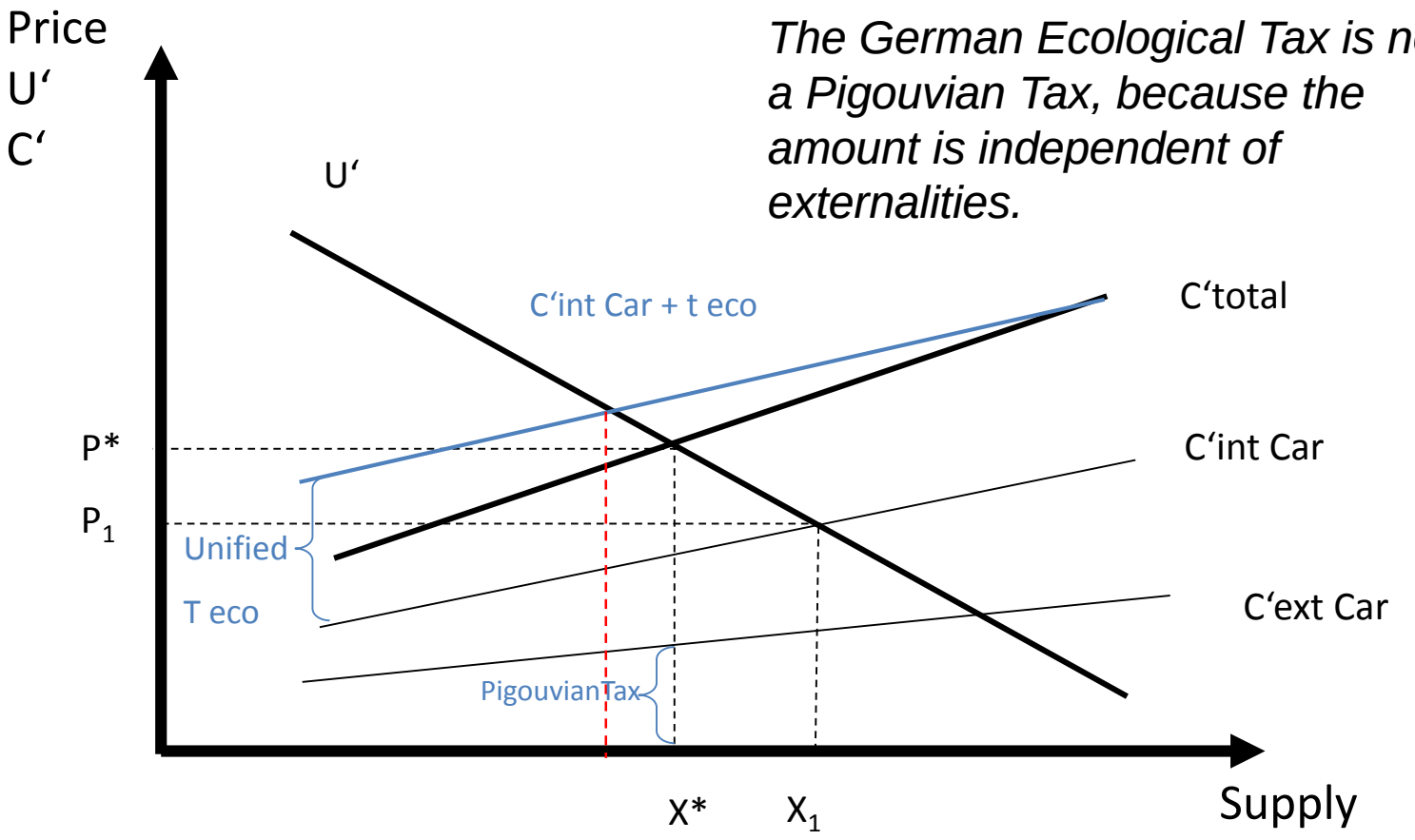


Moped riders cause larger externalities than car drivers …

The ecological tax must correspond to a Pigou Tax for optimal taxation of moped riders.



A unified ecological tax can cause an over-internalization for vehicle drivers.



The German Ecological Tax is not a Pigouvian Tax, because the amount is independent of externalities.

How could an efficient ecological tax look like?

- A Pigouvian Tax always corresponds to the size of the marginal externality in the optimum.
- Basis for measurement of the German ecological taxation is fuel consumption.
- Fuel consumption, however, is not the only factor causing externalities: catalytic convertors, motor technology, etc. influence exhaust emission all influence, therefore, the externality.
- Taxation on the basis of exhaust emission would be dynamically more efficient.