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# Regulation and Contracts - a Coasian Approach

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# The Regulatory Challenge

- Pervasive regulation
  - who, what, how
- Evaluation
  - sufficiently broad – or too extensive?
  - individual elements appropriate?
  - overall consistency?
- Overall approach or perspective
- Here: natural monopoly elements
  - networks
  - supply security
  - system operations



## Approaches

- Regulation of conduct
  - prices, quality, investment
  - rate-of-return, revenue-cap or price-cap regulation
- Regulation by exposure to competition
  - competition from alternative energy sources (electricity vs gas)
  - auctioning of monopoly rights
- Regulation by contract
  - establishing and enforcing rights and responsibilities of individual market participants
- *Ex post* regulation
  - abuse of dominant position
  - competition policy



## The Coase Theorem

- “*So long as property rights are well defined, and may be transferred without transaction costs, market equilibrium outcome will be efficient.*”
- Coase’ original example: trains, sparks and crops on fire
- Importance of property rights
  - facilitate decentralised decision-making
  - transactions costs
  - allocation of costs and benefits
- Note that the Coase Theorem is true also in the presence of economies of scale and scope, monopoly, public goods and externalities

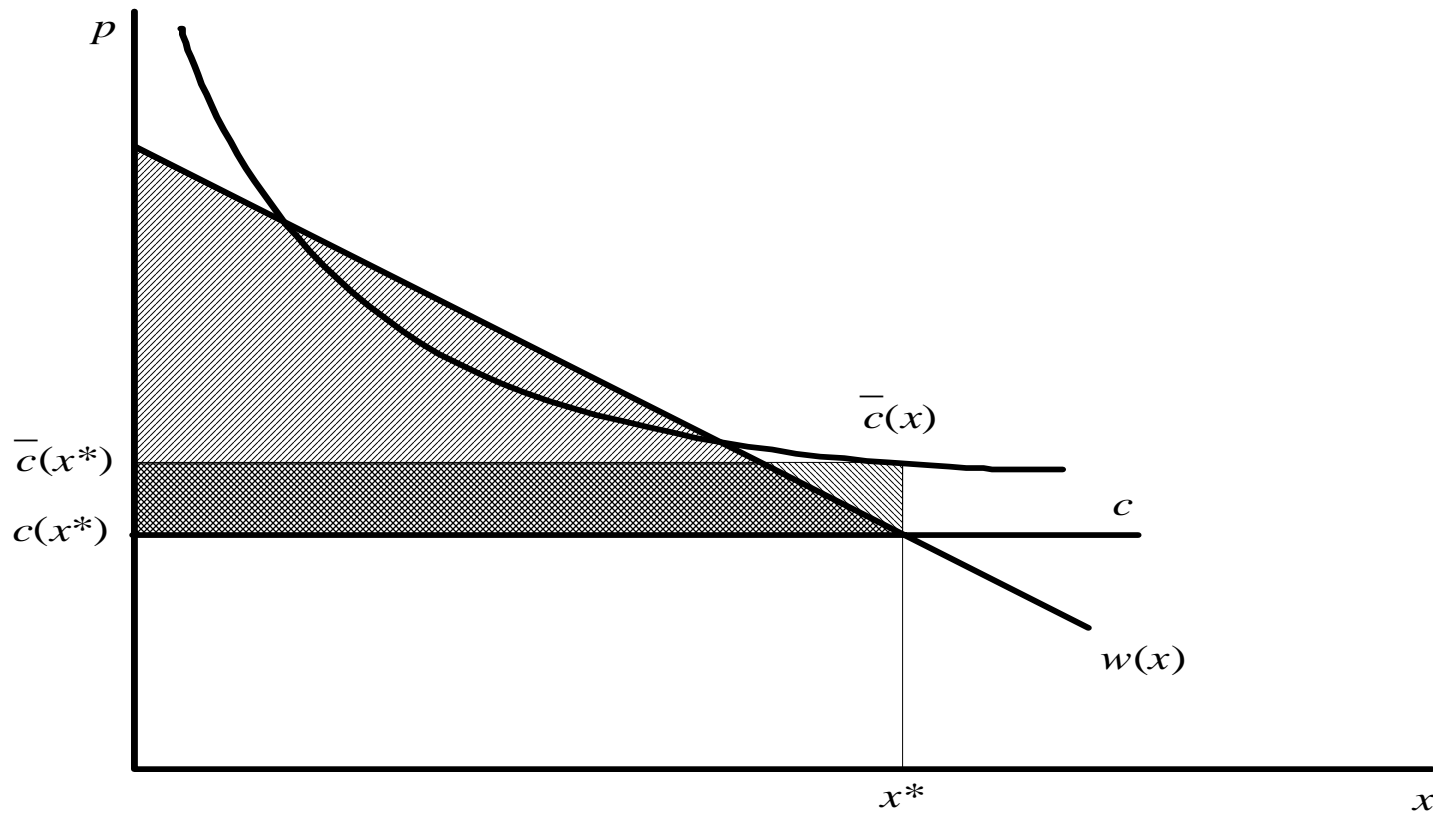


# Natural Monopoly

- Supply: decreasing average cost
  - high fixed costs
  - low variable costs
- Demand: decreasing marginal willingness to pay
- Efficiency: all mutually beneficial transactions undertaken
  - marginal willingness to pay equal to marginal cost
  - payments do not exceed total willingness to pay
  - payments sufficient to cover total costs



# Natural Monopoly - Example





## Naturally Monopoly

- Efficiency requirements do not specify form of payments
  - two-part tariff
  - price discrimination
- Efficiency requirements do not determine allocation of gains
  - all participants must receive non-negative payoffs
  - efficiency is consistent with skewed allocations
- Property rights
  - allocation of gains: if supplier holds the rights to the good, he may – in the absence of transaction costs – extract the entire surplus
  - transaction costs: asymmetric information may limit opportunities for price-discrimination and hence realising gains from trade
  - freedom of contract: non-discrimination regulations may restrict opportunities for realising gains from trade



## Why Regulate?

- When conditions of Coase Theorem hold
  - no efficiency or market failure reasons for regulation
- Enforcing property rights
  - private versus collective enforcement
  - costs of enforcement
  - regulatory institutions: control, sanctions
- Allocation of property rights
  - rights and responsibilities
  - benefits and costs
- Examples
  - structure and level of network tariffs
  - rights to connect
  - security and quality of supply



## Why Regulate?

- When conditions of Coase Theorem do not hold
  - efficiency or market failure reasons to regulate
- Clarifying property rights
  - example: metering and settlement
  - example: quality and security of supply
  - example: network connection and investment
- Reducing transaction costs
  - reducing volume of (i.e. need for) transactions
  - reduce costs of individual transactions
  - note: private incentive to reduce transaction costs, eg. by vertical integration



## Reducing Transaction Costs

- Reducing volume of transactions
  - allocation of property rights (to those who value them the most)
  - example: consumer rights to security of supply
  - example: horizontal and vertical integration of networks
- Reducing costs of individual transactions
  - establishing market places
  - improving transparency
  - standardising contracts
- Concerns
  - allocation: efficiency versus distributional concerns
  - private incentives: undermining private initiatives to reduce transaction costs (metering, standardisation of contracts)

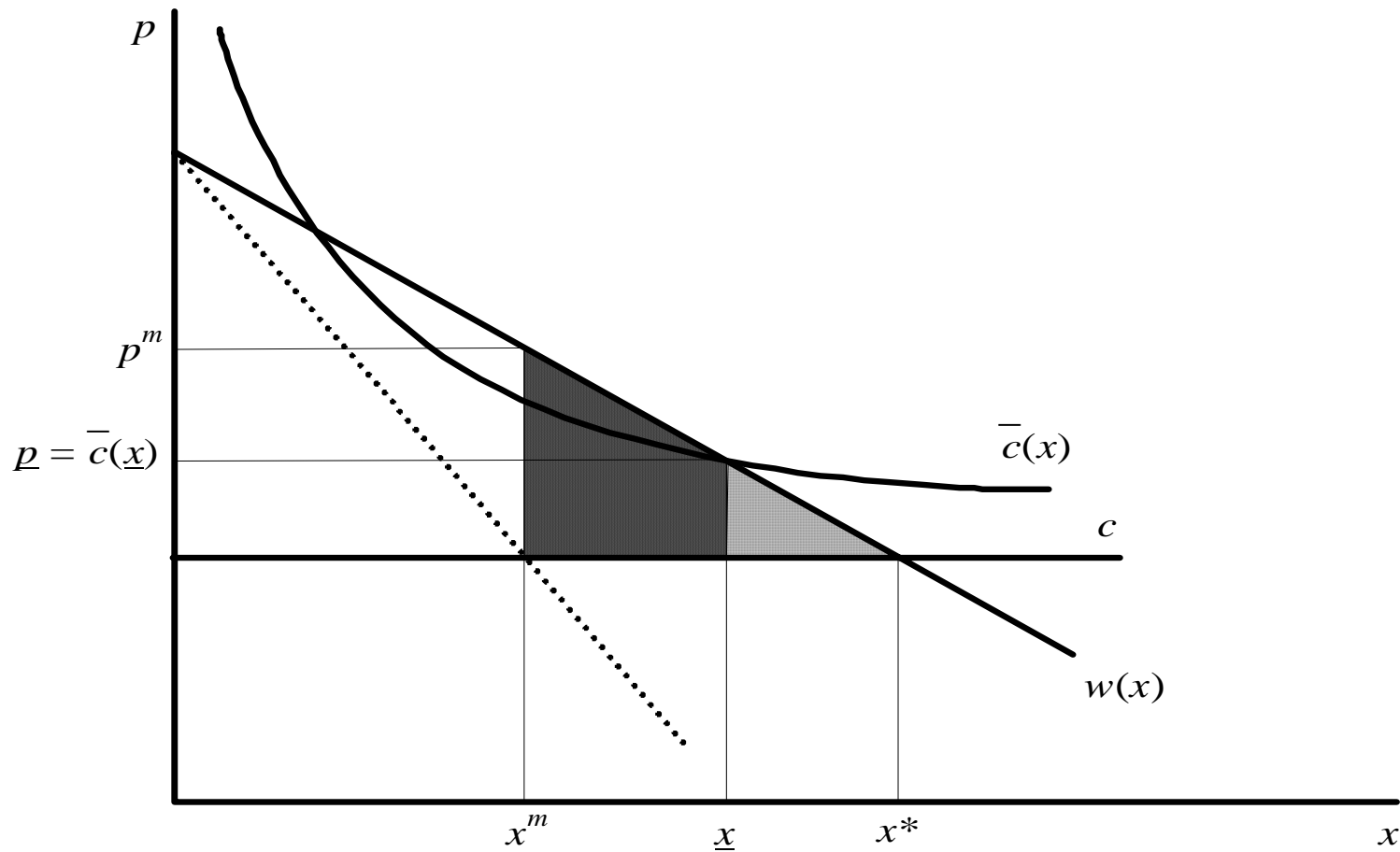


## Market Power

- Market participants have common interest in realising gains from trade, but conflicting interests wrt. allocation of gains
- No problem so long as conditions of Coase Theorem hold
- Otherwise, not all gains from trade may be realised
  - transaction costs
  - restrictions on contracts
- Consider again natural monopoly and suppose
  - all consumers must be offered identical contracts
  - payment is based on price per unit consumed (linear contract)
- Then, monopolist has incentive to set price above (marginal and average) costs



# Monopolistic Pricing





## Application: Security of Supply

- Rights and responsibilities
  - feeding in and taking out power
  - exposure to constant voltage/frequency
  - compensation for losses due to imbalances
  - maintaining balance
- Transaction costs
  - stochastic shocks (generation, consumption, network)
  - cost of establishing and transmitting information (price signals)
  - cost of monitoring and reacting to information



## Allocation of rights and responsibilities

- Responsibility for maintaining balance
  - centralised, in order to save on costly, multi-lateral contracting
  - system operator
- Rights to feeding in and taking out power
  - without such rights, individual market participants must enter into reliability contracts with system operator to avoid rationing
  - with such rights, system operator must enter into interruptible supply/demand contracts with individual participants to ration
  - latter likely to involve lower transaction costs
- Compensation for losses due to imbalances
  - such rights would establish incentives for system operator to maintain balance
  - however, costly to enforce



## Regulation of System Operator

- Efficiency requires portfolio of contracts with market participants
  - costs of entering into contracts (favours long-term contracts, cf. contracts for interruptible demand/supply)
  - ability to adjust to changing circumstances (favours short-term contracts, cf. balancing market)
- Incentives to optimise security of supply
  - costs of imbalances (loss of load) versus costs of maintaining balance
  - penalties for imbalances (compensation)
  - no need for regulating contracts or market institutions



## Application: Network Access and Capacity

- Rights and responsibilities
  - access to transmission/distribution network
  - conditions for such access
  - provision of network capacity
- Transaction costs
  - estimating costs of network access and use (externalities)
  - asymmetric information about costs and benefits



# Allocating rights and responsibilities

- Access to network
  - without such rights, each market participant would have to persuade network owner to allow access
  - with such rights, network owner required to demonstrate unreasonableness of request in order to avoid providing access
  - latter likely to involve less transaction costs (at least for small consumers)
- Conditions for access
  - with access rights, network owner implicitly obliged to offer “reasonable” terms
  - excessive use likely without minimum conditions (cost coverage)
  - transaction costs of contract negotiations may be considerable
- Provision of network capacity
  - with access rights, network owner implicitly obliged to provide such capacity
  - “merchant investment” likely to lead to considerable transaction costs



## Regulation of tariffs

- Transaction costs
  - may require standardisation of contracts
  - attributable versus non-attributable costs
  - distinction between types of users (consumers vs generators, small vs large consumers)
- Tariff levels
  - transaction costs may lead to inefficiently high tariff levels
  - regulation to bring tariffs closer to (marginal) cost
- Tariff structure
  - apart from standardisation, efficiency does not require regulation of structure
  - conditions of non-discrimination and other restrictions on structure may reduce opportunity for raising revenues efficiently



## Further on Tariff Regulation

- Profit-maximising pricing
  - high margins on inelastic demand segments, and *vice versa*
- Efficient pricing
  - minimising distortions of raising revenues to cover fixed costs
  - high margins on inelastic demand segments, and *vice versa*
- Correspondence between profit-maximising and efficient tariffs
  - different levels (maximum vs zero profits)
  - similar structure
- This suggests that regulation should concentrate on price levels (average prices), while decisions on pricing structure may be decentralised



## Regulatory Approach: Conclusion

- Traditional approach based on neoclassical welfare economics
  - starting point: model of perfect competition, prices
  - focus on regulation of quality/quantity and prices
  - restrictive assumptions concerning contracts and institutions
  - tends to both underrate and restrict markets' ability to realise efficiency gains
- Contractual approach
  - starting point: rights and responsibilities, transaction costs
  - focus on regulation of property rights, contracts and institutions
  - may be more important to clarify and enforce property rights than to regulate their transfer, incl. contracts and institutions
  - to the extent that contracts be regulated, standardisation may be more important than specific terms