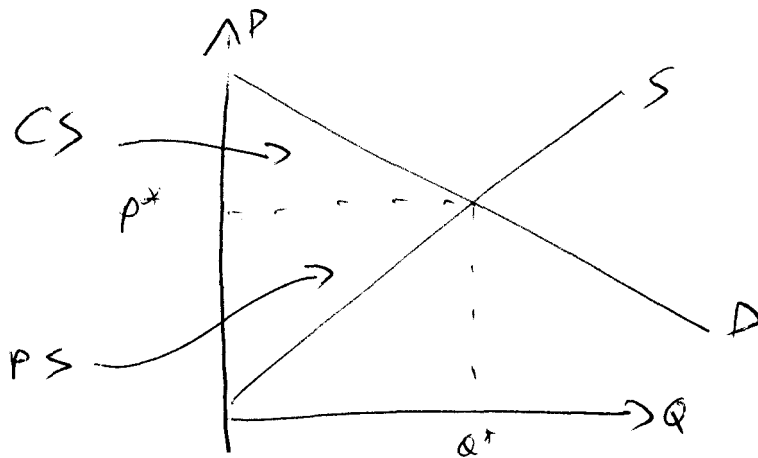


Applied Economics For Managers
SUMMARY
Friday July 9th 2004

What you need to know for the exam...and some things you don't – can't make it too easy!

Supply and Demand Model/Competitive Equilibrium

- i) Positive analysis – finding the equilibrium, identifying shocks and which curve they operate through, finding the new equilibrium, policy analysis – taxes, price ceilings etc.
Normative/welfare/surplus analysis – understanding economic efficiency in its various forms – maximizing total surplus, all mutually beneficial trades carried out, no Pareto improvements (make one person better without making anyone else worse), calculating consumer and producer surplus, competitive equilibrium is efficient in this sense, welfare consequences of policies such as taxes



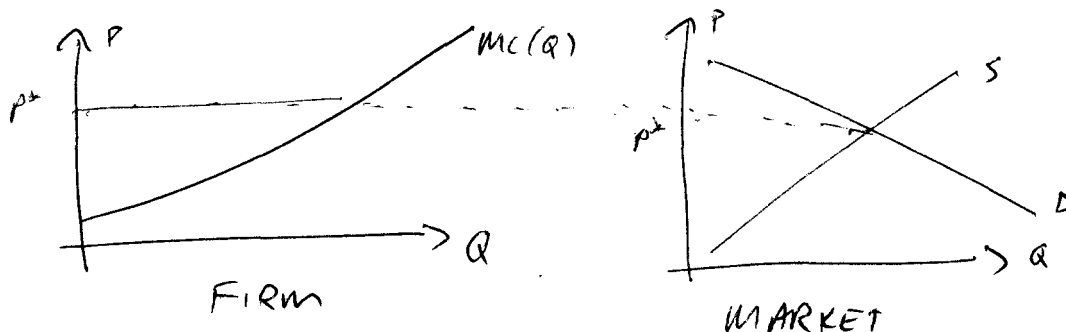
Behind the Demand Curve

Deeper understanding of demand:

- i) consumers maximize utility
- ii) EQUIMARGINAL PRINCIPLE - $MU_1/p_1 = MU_2/p_2$ – Equate "bang for the buck" at the margin across different goods
- iii) Demand is MARGINAL VALUE
- iv) Consumer surplus is therefore a measure of the total value of consumption
- v) Demand Curve slopes down

Behind the supply curve

- i) Firms maximize profits = Revenue - Total Cost
- ii) Maximize at $MR=MC$
- iii) For competitive firm - PRICE TAKER - MR curve is just the market price p
- iv) SUPPLY CURVE IS $p=mc(q)$, and the only decision the firm makes is its QUANTITY Q FOR ANY GIVEN PRICE p
- v) Supply curve represents to MARGINAL COST OF PRODUCTION
- vi) Supply Curves slope up if marginal costs increase
- vii) Producer surplus is equal to the ECONOMIC PROFIT of the firm (except for fixed costs if there are any, but don't worry about this)

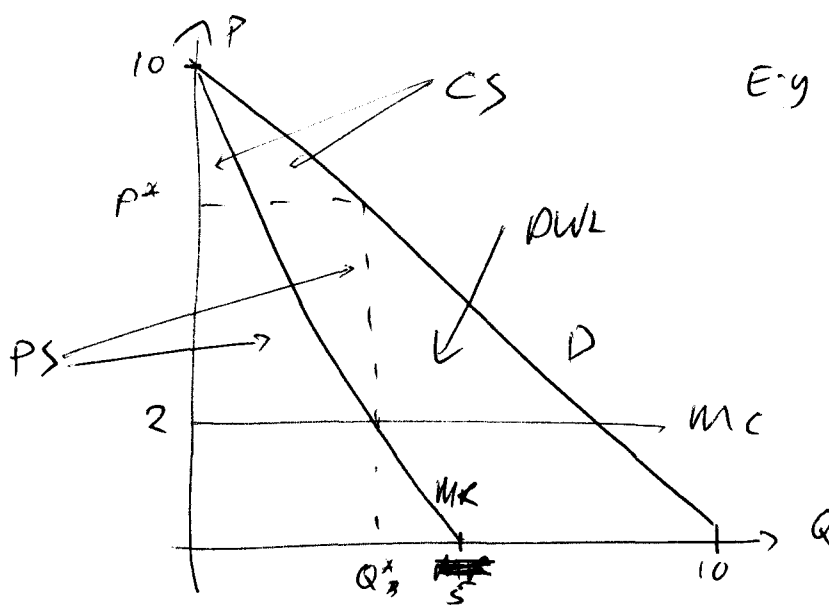


Monopoly

Monopoly is example of a firm with pricing power - i.e. doesn't just take the market price as given, but chooses the price itself. Many of the insights of this extreme case are relevant to industries with more than one firm, but which are not perfectly competitive.

a) Single Price Monopoly

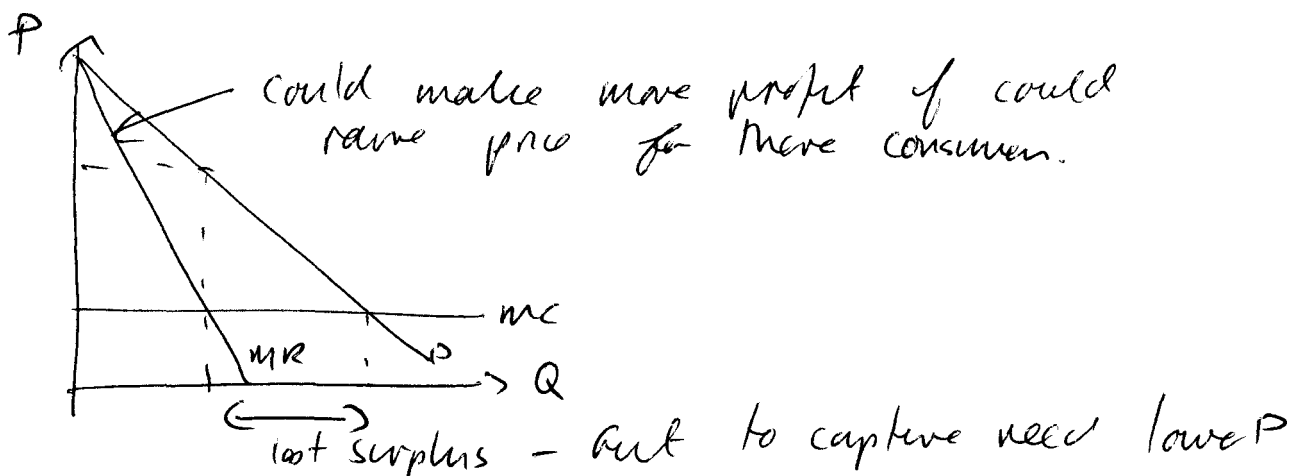
- i) Monopolist does not consider the price as fixed like competitive firm, but understands that it is determined directly by demand curve
- ii) Maximizes profits $MR=MC$
- iii) MR CURVE IS DERIVED WITH TWICE AS STEEP RULE: Demand $P=A-BQ$ gives MR curve $P=A-2BQ$
- iv) MR slopes down because as the monopolist increases output the price has to fall - this makes the monopolist less inclined to increase output than the competitive firm
- v) Monopolist restricts Q to raise P - this increases profits (PS) but creates inefficiency (DWL) compared to competition



E.g. $P = 10 - Q$
 $MC = 2$
 $MR = 10 - 2Q$
 $MR = MC \Rightarrow 10 - 2Q = 2$
 $\Rightarrow Q^* = 4$
 (substitute) $\Rightarrow P^* = 6$
 in D!

b) Price Discriminating Monopoly

- i) Deadweight loss with single price is also potential loss for monopolist – can we capture that surplus related to the low value customers without losing the profits on the high value customers?
- ii) General goal – CREATE SURPLUS (expand the market while it is efficient to do so) and CAPTURE SURPLUS (find a pricing strategy that turns the consumer surplus created into producer surplus)
- iii) These goals conflict if charge a single price as the market expands with lower prices but profits increase with higher prices – price discrimination resolves this tension
- iv) Price discrimination can increase both profits and economic efficiency (reduce DWL) but also affects distribution as more surplus goes to producers
- v) Price discrimination is only possible if a) can separate the consumers into different groups and b) can prevent resale so that low price groups can't resell to high price groups.
- vi) Much firm behavior can be understood as price discrimination – student/senior discounts, quantity discounts, two-part tariffs, early bird specials/happy hours, airline tickets (e.g. how flexible the ticket is to change), bundling and tying.
- vii) Price discrimination can be a double-edged sword – in game theory we see that competition is very intense when price is the strategic variable. Price discrimination essentially converts one large market into many individual markets with separate prices and separate competitive pressures – if this really intensifies competition it can be detrimental to profits.



Game Theory

Study intermediate situations between pure competition and pure monopoly. Small numbers of players – firms, workers, etc – with STRATEGIC INTERACTION – each player knows that his choices have an impact on the objectives of the other players.

Simultaneous Games:

- i) Identify the players
- ii) Identify the strategic choice variables
- iii) Set up the game matrix with the payoffs for each player as a consequence of the strategy choices of each player, put the player with strategies described by the rows as the first payoff in each cell.
- iv) Find the equilibrium (can be multiple).
- v) **NASH EQUILIBRIUM - EACH PLAYER IS PLAYING HIS BEST RESPONSE TO THE STRATEGY THAT THE OTHER PLAYER IS PLAYING.** Given the strategy for player A, find that such that player B does not want to change (i.e. B's best strategy given A) – repeat for A: given B's strategy does A want to change?
- vi) Sometimes there is a **DOMINANT STRATEGY** which is always played, or **DOMINATED STRATEGIES**, which are never played and can be ruled out.

Sequential Games

- i) Set up the **GAME TREE** – each node is a decision a player has to make, each branch represents the actual decision
- ii) Solve the game by **BACKWARDS INDUCTION** – start with the last stage, find the optimal strategy of the player in that stage, and work back until we find the equilibrium sequence of decisions
- iii) This leads to a Nash Equilibrium, but it puts additional restrictions – it ensures the strategy is **CREDIBLE** – that no player is making a threat that would not be carried out in equilibrium – e.g. the entry game we considered in recitation.
- iv) Sequential Games can have first mover advantages or disadvantages depending on the nature of the strategic interaction – e.g. if we play a quantity game it can be an advantage as you take over the majority of the market, with a pricing game you give your opponent the chance to undercut you.

Key Games that we have seen:

- i) Bertrand Game – Price competition – very intense, price gets bid down until the highest cost player is out of the game
- ii) Cournot Game – Quantity Competition – less intense since other player cannot steal your share of the market as he can in a price game – market gets more competitive as we increase the number of firms.

iii) Stackelberg Game – Like Cournot Game, but play is sequential – this is an example of a situation where it is advantageous to go first.

Other common games:

Prisoner's dilemma – useful to think about cartels or other competitive situations where one side can benefit from cheating the other. Good example of a game where the Nash Equilibrium is not socially optimal.

Coordination Games – to think about technology adoption for example – firms deciding whether to produce complementary goods.

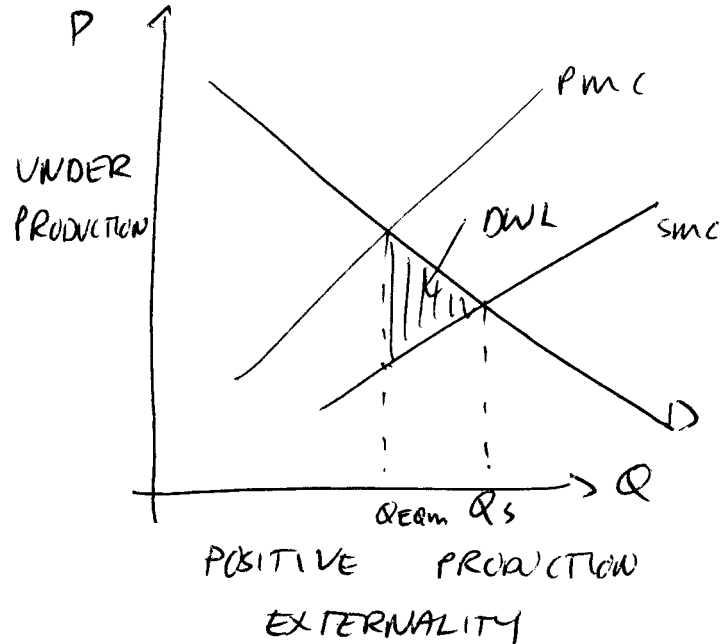
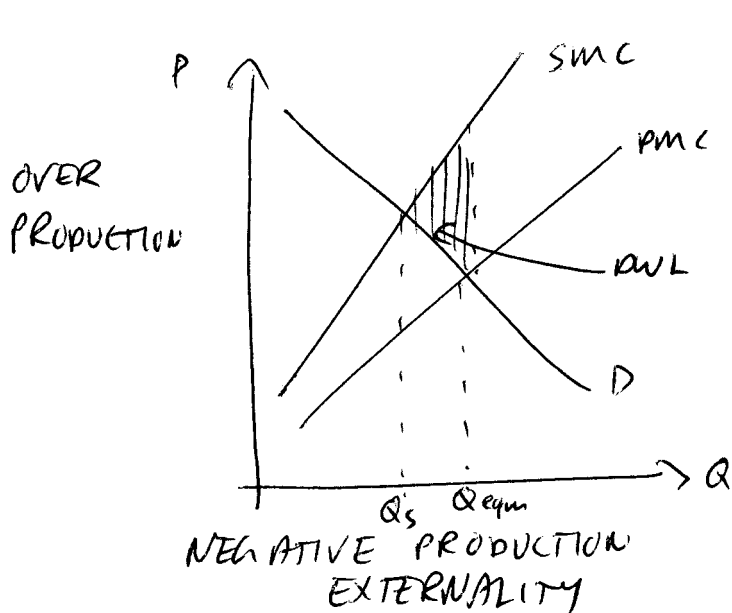
Externalities

Up to this point, the only reason we have seen that competitive markets do not maximise efficiency/welfare is because of monopoly/competition problems. Externalities are a major class of problems where competitive markets deliver suboptimal outcomes.

Externalities are a more fundamental problem with market economies since they undermine the very basis for leaving things up to private decisions. If there are no external costs and benefits we would expect that individuals can reach the best decisions about their own economic choices – with externalities it is the process of private decision making that is causing the problem.

Main results:

- i) Main problem is that price does not indicate value/cost at the margin – sends the wrong signal to market participants
- ii) Price differs from marginal social cost/benefit because some of the costs and benefits accrue to THIRD PARTIES
- iii) Market is inefficient – ~~DRAW AN EXAMPLE~~
- iv) Under production of goods with positive externalities, Over production of goods with negative externalities
- v) Need to intervene in the market to maximise welfare: taxation, regulation, or the creation of markets for the external good- key idea is to make sure agents making decisions face the "right" prices at the margin – i.e that represent all the social costs and benefits.
- vi) COASE THEOREM – if the externality affects a small number of people, it should be possible to assign property rights over the problem good (e.g. clean water) and let people bargain – in this view the main problem with externalities is the lack of the right markets/property rights.



Choice Under uncertainty

Choice under uncertainty allows us to extend the idea of consumer demand to situations with RISK. Key idea is to include the concept of RISK AVERSION – people do not like risk and if give a choice will choose safe over risky alternatives with the same expected payoffs.

Expected Utility Theory – We formalize this idea with the concept of EXPECTED UTILITY. We measure the welfare of a person in a risky situation by taking the expectation of the utility of the various payoffs – WE WON'T TEST YOU ON THIS EXCEPT FOR AN INTUITIVE UNDERSTANDING OF RISK AND RISK AVERSION.

Main Ideas:

- i) **Insurance** - Risk Averse people always demand actuarially fair insurance – this creates surplus since it removes risk.
- ii) **Asset pricing** - Risk aversion translates into a dislike for variance in asset returns
- iii) **DIVERSIFICATION** – Risk aversion creates a desire for diversification since this allows for risk reduction
- iv) The risk that cannot be removed by diversification ("market risk") is reflected in the price of assets – higher expected return for higher market risk. This is the CAPM. Market risk is measure by the assets's BETA

$$E(R_A) = R_F + \beta_A(R_M - R_F)$$

RM is the RETURN ON THE MARKET

RF is the RETURN ON THE RISK FREE ASSET (E.G. TREASURIES)

RM - RF is the PRICE OF RISK or RISK PREMIUM

β_A is the AMOUNT OF MARKET RISK IN THE ASSET A.

i.e RM and RF are properties of the market as a whole

β_A is a property of the particular asset in question – and we would measure it with historical data on the covariance of the returns on the given asset A and the market as a whole.

Asymmetric Information

Together with externalities, asymmetric information constitutes the other major category of situations in which markets don't work well. We studied two types of information problems:

Adverse Selection

This occurs when there is asymmetric information prior to making a transaction. The problem is that the worst individuals from the point of view of the uninformed party tend to select into the market, since at any price the uninformed cannot tell them apart.

This reduces the willingness of the uninformed to trade;

- i) Markets can break down completely with adverse selection
- ii) There are trades that would take place if both parties were informed that do not.

Examples:

Used car market ("lemons"), Insurance markets

Moral Hazard

Second major class of information problems that we looked at is MORAL HAZARD. This occurs when asymmetric information develops after contracts are signed. Typical example is the employment relationship where the amount of effort that a worker exerts is private information. Key ideas:

- i) when "effort" is private information, need to provide INCENTIVES – in particular, paying a flat salary will have no incentive effects and effort will be low
- ii) Can provide incentives in many equivalent ways, but all must satisfy INCENTIVE COMPATIBILITY – the worker must voluntarily choose to exert high effort because the incentive structure makes it privately optimal, and PARTICIPATION CONSTRAINT – can't force people to work so the incentive contract must pay at least as much on average (or expected utility) that the agent can get elsewhere
- iii) Risk aversion makes the problem more difficult – the only way to provide incentives is to expose the worker to risk, in the sense that his wages are not constant, but depends on circumstances. If worker is risk averse this presents a dilemma as it is cheaper to pay him without risk as will accept less on average, but that will have really bad incentive effects. Need to find a balance between insuring the worker against the risk of the enterprise and exposing him to risk so he works hard.

Contracts/Mergers/Integration

Studied two major reasons why firms might want to integrate, each based on an inefficiency in the intra-firm relationship

a) Double Marginalization

- i) With firms in a vertical relationship (or more generally selling complementary products), if both are price setters, e.g. monopolists, then there is **TOO HIGH A MARKUP** – Each firm adds a mark-up to increase its profits, but the way it does this is by creating a scarcity and driving up the price.
- ii) This scarcity reduces the profits of the other firm, **BUT THE PRICE SETTER DOES NOT TAKE THIS INTO ACCOUNT** – Each firm is exerting a negative externality on the other when they set prices independently and as a result the price is too high and profits are reduced.
- iii) Integration leads to a single price that maximizes **JOINT PROFITS** – since value is created, we can find a price that will allow one of the firms to profitably buyout the other.

b) Hold-up Problem

- i) If firms have to make specific investments that will also benefit their partner, such investments will typically be undersupplied e.g. I don't have the incentive to invest in cost-reduction if part of the gains are swallowed by a reduced price for the good I'm selling – this is the **HOLD UP PROBLEM** – After you have made the investment it is sunk and the other firm will just take advantage of the situation and bargain down your selling price once your costs are cut.
- ii) Need to align the benefits of investment with the costs – in general the party that has the investment to make should be the owner of the structure so that he can fully capture the benefits
- iii) Integration is one way to correct the incentives – if the investing firm buys out its partner, value will be created since it can now undertake the efficient level of investment without worrying about losing the benefits.
- iv) Other solutions are possible such as structuring contracts so that the investor is not held up – e.g. fix the selling price before the investment if the investor is upstream so that the benefits of cost reduction accrue to the investor.

General point: A merger only makes sense if it eliminates some inefficiency in the relationship between the firms if they are separate. However even in this case, a merger might be a sufficient, but not a necessary condition – other solutions such as structuring contracts between the firms to provide the right incentives can also deliver the efficient outcome (in the sense of increasing the profits of both firms).

Collective Decision Making

Even when individuals are rational, the process of aggregating opinions to produce a collective decision can lead to "irrational" outcomes. This is not to say that people are not acting in their best interest or are unaware of the perverse consequences of their choices, but rather the process of collective decision making itself creates incentives so that social choices are not always efficient.

- i) method of social choice influences the outcomes and there is not one single social choice
- ii) social choices can show inconsistency – CYCLING/CONDORCET
- iii) Uncertainty about consequences of choices can lead to a STATUS QUO BIAS.
- iv) Inefficiency – log-rolling or vote trading can lead to inefficient outcomes from social perspective.
- v) Danger of "capture"

Free Trade

- i) Gains from trade are derived from specialization
- ii) Patterns of specialization are determined by COMPARATIVE ADVANTAGE – each country produces the goods that are RELATIVELY cheap to produce
- iii) Even if a country has NO ABSOLUTE ADVANTAGE – it doesn't have the lowest costs of production for anything – there are still gains from trade as it is better to use its resources to produce something – the key thing here is ECONOMY-WIDE RESOURCE CONSTRAINTS – even if I'm more efficient I only have a fixed labor force, so it's still beneficial at the margin to reallocate that labor to its most productive use and import things in which I'm relatively less productive.
- iv) Be careful making analogies between the competitive process between firms and between countries – trade between countries is based on MUTUALLY BENEFICIAL EXCHANGE – one country can't drive another out of business.
- v) Free trade increases the goods available to everyone – increases consumption possibilities
- vi) Why is trade not free – process of adjustment will hurt producers in the declining industries who then seek protection – the gains to protection are concentrated, but the costs are diffuse, so more political demand for protection than free trade.

And that's all folks!