H3 Economics

A Guide To Syllabus 9808

Nigel Fong & Joyce Ong 2010

N.B. Many quotes are truncated and edited. Some paragraphs are unapologetically plagiarized.

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1 Philosophy Of Economics

Syllabus Objectives

- examine and critique the significance of economics to the individual, society, the nation and the international economy
- examine and critique the nature and significance of economics as a social science; compare and contrast economics with the natural sciences
- distinguish between the inductive and deductive methods of economic inquiry
- examine the foundations of economic analysis
- evaluate the usefulness of economic models in relation to the plausibility of assumptions (ceteris paribus, rationality, other assumptions); logical fallacies (fallacy of composition, post-hoc fallacy, other conditions fallacy); and statistical limitations (misleading comparison, selection bias, other limitations)

1.1 The Nature Of Economics

1.1.1 What is economics?

Philosophical reflection on economics is ancient, but the conception of the economy as a distinct object of study dates back only to the 18th century. With the increasing importance of trade, questions were raised concerning the balance of trade and the regulation of the currency. There was an increasing recognition of the complexities of the financial management of the state and of the possibility that the way that the state taxed and acted influenced the production of wealth. Trade existed before economics of trade did. Smith emphasizes tracing out the unintended consequences of the actions of individuals. Unobvious regularities are the unintended consequences of individual choices.

> *"He intends only his own gain; and he is led by an invisible hand to promote an end which was no part of his intention... By pursuing his own interest, he frequently promotes that of the society more effectually than when he really intends to promote it". (Smith)*

Economics can be defined as a subject-matter: the production, exchange, distribution, and consumption of commodities, or as a study of forces:

> *"Economics makes entire abstraction of every other human passion or motive, except those which may be regarded as perpetually antagonising principles to the desire of wealth, namely aversion to labour, and desire of the present enjoyment of costly indulgences." (Mill)*

Economics is hence the study of rational agents choosing among feasible alternatives whatever maximizes utility, and suppoes that other non-percuniary preferences are rare and unimportant; what is important is rationality plus a desire for wealth & consumption.

> *"Economics is studying human behavior as a relationship between ends and scarce means which have alternative uses" (Lionel Robbins)*

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Some consider Economics to be a science. Whether is so rests on three questions: (1) Are there fundamental differences between the structure or concepts of theories and explanations in the natural and social sciences? (2) Are there fundamental differences in goals? (3) Are social phenomena too "irregular" and man too irrational to be captured by laws and theories? Economies are constantly changing and theory affects action (1.3)

1.1.2 The Purpose Of Economics

> *Practical men, who believe themselves to be exempt from any intellectual influence, are usually the slaves of some defunct economist (Keynes)*

Economics may be of **intrinsic value** – an appreciation of the complex forces of human agency. It may provide **explanation**: uncovering causal forces at work, tracing unintended consequences of human action. Weber has a higher standard of understanding: in addition to or instead of the predictive and explanatory goals of the natural sciences, the social sciences should aim at providing us with understanding "from the inside", that we should be able to empathize with the reactions of the agents and to find what happens "understandable".

Economics may also help to **predict** economic outcomes, and hence influence them through policy. Yet, Joan Robinson reminds us that there are no easy answers.

> *"Its task is to provide a system of generalizations that can be used to make correct predictions about the consequences of any change in circumstances." (Friedman).*

> *"The purpose of studying economics is not to acquire a set of ready-made answers to economic questions, but to learn how to avoid being deceived by economists" (Joan Robinson)*

Prediction may not be enough; explanation need not imply prediction, prediction only requires correlation, explanation requires something more. Explanations can be complementary but predictions oppose and can be mutually exclusive. While prediction may not be mutually exclusive from explanation, explanation can be hard to come by.

> *"Back box theorizing i.e. making predictions without explanation can be dangerous because the moment the predictions fail, the theory has to be discarded totally since it lacks a logic that can be adjusted and improved." (Blaug).*

> *"Yet, insistence for causal mechanisms if taken at face value may be harmful to scientific progress... the case of Newton's gravitation" (Blaug)*

> *"Explanation is prediction written backwards" (Marshall).*

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Economics has always been connected with **policy**, with the desire to improve economic affairs, eradicate poverty, equalize the distribution of income and wealth, combat depressions etc. For economists to prescribe policy, they must be able to predict e.g. that devaluations cures BOP deficits and how quickly, that inflation can be reduced by fiscal or monetary policy and what is necessary to cut inflation by a given percentage. As Mankiw puts it, the economist should not only be a scientist, but an engineer (or a dentist, as Keynes says), driven by the pragmatic interest of progress.

> *Economics should be practical. Theory should not be judged by its ssumptions but by whether it can satisfactorily predict economic behaviour in the real world. (Friedman)*
>
> *"God put macroeconomists on earth not to propose and test elegant theories but to solve practical problems" (Mankiw)*

Economics serves to provide tools to address **questions of welfare**. The prevailing view among economists has shifted from hedonism (the good is a mental state such as pleasure or happiness) to the view that welfare is the satisfaction of preferences – Economics is about finding out what is good for a person rather than committing itself to any substantive view of a person's good. This is a perspective that promotes freedom: welfare being the satisfaction of preferences implies that a person is better off if what he or she chooses.

There are however many obvious objections to the view that well-being is the satisfaction of preferences. Preferences may be based on mistaken beliefs, be manipulated or distorted. It also becomes very difficult to make interpersonal comparisons of well-being. Furthermore, it seems unreasonable that social policy should attend to extravagant preferences.

Higher values and virtues are important to some: Amartya Sen asserts that a major deficiency of contemporary economic theory arises from interpreting Adam Smith's view of human beings as being exclusively self-interested in a material sense. This theoretical deficiency in turn leads to bad policy recommendations by economists.

> *In our view, economists, as with all scientists, have an ethical responsibility to communicate the limitations of their models and the potential misuses of their research. (Dahlem Report)*

Alas, to Krugman, as to far too many ex-economists in partisan debates, economics is not a quest for understanding. It is a set of debating points to argue for policies that one has adopted for partisan political purposes. "Stimulus" is just marketing with which to sell voters on a package of government spending priorities that you want for political reasons. It's not a proposition to be explained, understood, taken seriously to its logical limits, or reflective of market failures that should be addressed directly.

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1.1.3 The Imprecision of The Subject Matter Of Economics

While there may be much similarity between the structure or concepts of theories and explanations in the natural and social sciences:

> *"Economics is to be judged by the precision, scope, and conformity with experience of the predictions it yields. In short, positive economics is, or can be, an 'objective science, in precisely the same sense as any of the physical sciences" (Friedman)*

> *"Economic science is but the working of common sense aided by appliances of organised analysis and general reasoning, which facilitate the task of collecting, arranging, and drawing inferences from particular facts" (Marshall)*

The **irregularity** of social phenomenaand irrationality of man may prove difficult to be captured by laws and theories. Given human free will, perhaps human behavior is intrinsically unpredictable and not subject to any laws. Somewhat harsh criticisms come from Samuelson and Gabraith

> *The only function of economic forecasting is to make astrology look respectable (Gabraith)*

> *"Economists predicted 9 out of the last 5 recessions (Samuelson)*

But there is, in fact, much regularity in human action, and natural sciences must cope with many irregularities and enormous causal complexities, too. The **law of large numbers** allows for some regularity to be observed (while my neighbour might not necessarily buy a car if the price falls, on the whole, the number of cars sold will rise).

What is clear, however, is that economics must cope with much complexity:

> *"The forces of which economics has to take into account are more numerous, less definite, less well known, and more diverse in character than those of mechanics; while the material on which they act is more uncertain and less homogeneous" (Marshall)*

> *Due to the nature of economic material, "a generalisation to cover everything is impossible and impracticable" (Keynes)*

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1.2 Economic Inquiry

Methododology is both a descriptive discipline (this is what most economists do) and a prescriptive one (this is what economists should do to advance economics); it does not provide a mechanical algorithm for constructing and validating theories. (Blaug)

1.2.1 Sources Of Information: Induction & Deduction

Deduction involves establishing premises and deriving a conclusion that necessarily follows and is definitely true if the premises are true. Deduction necessary provides an explans for the prediction. **Introspection** may be constituted as a form of deduction. Economists may introspect to determine the rational axioms that serve as the 'principles of motion' of economic agents, and from a bedrock of aggregated individual actions derive economic tendencies.

However, introspection to derive a "rational economic man" and then the extrapolation of this onto the macroeconomy is problematic, for it incurs a fallacy of composition. Furthermore, another worry with deductive information is that it might suffer an infinite regress of justification, as subsequent theories build up on the conclusions of prior ones. For instance, the law of diminishing marginal returns is necessary to prove the risk-adversity of individuals.

Induction has a double meaning: the inductive determination of premises, and the inductive verification of conclusions (Keynes)

Induction is the inference of a generalized conclusion from accumulated particular instances, allowing for a conclusion that is probably but not definitely true. Induction does not explain, merely predicts. Appeal to **historical example**, or **econometric analysis**, and the subsequent extrapolation of a general trend is an inductive approach.

"Economics is a historical rather than a predictive science" (McCloskey)

"The master-economist... must be mathematician, historian, statesman, philosopher... He must study the present in the light of the past for the purposes of the future. (Keynes)

All historical explanations are pseudo-explanations, they may be true or false but we will rarely know the case (hempel)

However, Mill maintains that direct inductive methods can study only phenomena with few causal factors in play (ceteris paribus). Investigating whether tariffs enhance or impede prosperity by comparing the prosperity of nations with high tariffs and nations without high tariffs, gives worthless results because the prosperity of the countries studied depend on many factors other than tariffs. A prediction without a logical explans is insufficient to satisfy most. Induction also suffers from a **Black Swan problem**: just because a turkey did not die the last 100 days does not mean that it may not die on the 101st.

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These methods are used in combination: Economists believe that demand curves slope down because of statistical evidence accumulating in journals. Yet more beliefs in the hypotheses come from other sources: deduction (a higher price leaves less disposable income), introspection (what would I do), and extrapolation (if the demand curve for iron slopes down, why not for love?). Theory, explaining causal mechanisms, provides a deductive basis for inductive conclusions.

1.2.2 Falsification

The Popperian view holds that theories are scientific if and only if their predictions are at least in principle falsifiable – this is the only way we can know if a theory is true: that it makes definite predictions about economic events.

Theories have been falsified include

- The Philips Curve which supposes a stable trade-off between inflation and unemployment broke down in the 1970s
- A stable velocity of circulation of money is now known to be untrue
- The Keynesian consumption function i.e. consumption as a function of only current income has been superseded by life-cycle consumption theory

On the other hand, empirical testing is difficult and ambiguous, given the near-impossibility of experiments, and the lack of ceteris paribus conditions. **Duhem-Quine thesis**: it is logically impossible to decisively refute any theory, since a refutation can always be blamed on inappropriate initial conditions. And in Economics the subsidiary assumptions are dubious and in many cases known to be false.

> *The pure theory of demand is not empirically refutable: the statistical law of demand only derivable by the addition of an extra auxiliary assumption: that the negative income effect is too small to offset the negative substitution effect of a price change. (Blaug) – ref Giffen goods*

One cannot hope to find many examples of theories being decisively knocked down by repeated refutations. Only 3/542 empirical articles in top journals attempted to falsify proposed hypotheses (Canterbery), and 50% of *American Economic Review* articles had models but no data (Leontief). Furthermore, rigorous falsification is so demanding that little of economics would survive if it were rigorously applied. Much economic models today introduce a 'fudge factor' to take into account unknown and unspecified errors.

In this, falsifiability and testability are matters of degrees – a continuum between hard science and soft science. Economics is ultimately the synthesis of both empirical methods and human analyses to demystify the workings of the economy and predict future economic activity

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Despite difficulties in falsification, small-scale artificial experiments may be possible. A team of Harvard and MIT students distributed malaria bednets freely in one part of malaria-ridden Western Kenya while selling the bednets in another part, then compared the result of the prevalence of the bednets in the two regions. They found that free distribution was more effective, dispelling the belief that a reliable distribution system can only take place in the context of a transaction. Computer modeling may also make falsification easier.

> *When circumstances change, I change my mind (Keynes).*

The salience of falsification is probably this: Theories must be confronted with empirical evidence as the final arbiter of truth, and as the view of radical falsificationism goes, empirical testing is a safety valve protecting economics from falling prey to dogmatism. We cannot avoid testing and turn to calibration (i.e. fudge factors) without explicit consideration of goodness-of-fit.

> *It is pretty obvious how the currently popular class of dynamic general equilibrium models would have to cope with the financial crisis. It will be covered either by a dummy or it would have to be interpreted as a very large negative stochastic shock i.e. equivalent to a large asteroid strike (Dahlem report)*

Some reality check is often needed: Prescott's "real business cycle" theory argues that fluctuations in demand have nothing to do with the business cycle. Rather, the business cycle reflects fluctuations in the rate of technological progress, which are amplified by the rational response of workers, who voluntarily work more when the environment is favorable and less when it's unfavorable. Hence, Prescott concludes, unemployment is a deliberate decision by workers to take time off. This does not seem to make much sense, and falsification provides a reality check. Falsification also helps to remove sources of bias:

> *Science can never be truly objective, to apply the scientific method, the researcher needs to have some intuition that compels him to research. (Schumpeter)*

There is fair argument against the use of immunizing strategems – inserting numerous 'outs' or making theories so vague that they can cover everything.

> *To predict and prescribe policy Economics must be first and foremost an empirical science of else it must abandon its age-old concern with "piecemeal social engineering" (Blaug)*

> *Economists would doom themselves to irrelevance if they were to surrender standards of predictive success, for it is upon such standards that policy decisions are made. (Rosenberg)*

Confirmationists make sure that their theories run few risks, and when faced with an empirical refutation, set about repairing the theory or amending its scope. An empirical refutation may just be a challenge to improve the model and not to reject the underlying theory. Not all confirmations of a theory are equal. Confirmations are more impressive if they have a greater chance of being falsified; the weight of confirmation is proportional to the potential for refutation.

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1.2.3 Paradigm Shifts And Economic Progress

Lakatos insists that testing is always comparative. When theories face empirical difficulties, as they always do, one attempts to modify them. If some of the new predictions are confirmed, then the modification is "**empirically progressive**," and one has reason to reject the unmodified theory and to employ the new theory, regardless of how unsuccessful in general either theory may be. What matters is empirical progress or retrogression rather than empirical success or failure. This causes **paradigm shifts** (Khun), a result of the intellectual competition between theories, and the challenge of conventional wisdom.

> *"Economists have spent a generation tossing and turning the Ricardian equivalence theorem, and assessing the likely effects of fiscal stimulus in its light, generalizing the "ifs" and figuring out the likely "therefores." This is exactly the right way to do things." (Cochrane)*

> *Estimate, don't test – draw on relevant empirical evidence to improve understanding of a phenomenon rather than trying to devise a yes-no test of a theorem explaining the phenomenon. (Leamer & Levinsohn)*

But the gain in content with paradigm shift can come with some loss of content. Even if theories are falsified,

> *"We must recognize the functional value in certain circumstances of clinging tenaciously to a refuted theory in the hope that it can be repaired to cope with newly discovered anomalies". (Popper)*

> *By misdirection we arrive closer at the truth (Milton)*

An alternative might be **methodological pluralism**: letting a hundred flowers bloom (Caldwell).

> *"Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world. It is compelled to be this, because, unlike the typical natural science, the material to which it is applied is, in too many respects, not homogeneous through time" (Keynes)*

> *But if all methodological standards are equally legitimate it is difficult to see what sort of theorizing is ever excluded; it is not even obvious why should we require theories to be logically consistent, or to assert something definite about the real world. (Blaug)*

An equally radical but opposite reaction is McCloskey's - in her view, the only relevant and significant criteria for assessing the practices and products of a discipline are those accepted by the practitioners. Perhaps the methodology which best supports the economist is the methodology that best fulfills what he seeks to do, but this undermines any principled argument for a change in standards.

It does seem, however, that dogmatism is not uncommon. The **Efficient Market Hypothesis** predicted (in its strong version) that rational players in financial markets would always set prices that reflected all available information in the most accurate possible way, so no investor could "beat the market". The evidence in its favour was limited.

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> *Ketchup economists have shown that two-quart bottles of ketchup invariably sell for exactly twice as much as one-quart bottles of ketchup, and conclude from this that the ketchup market is perfectly efficient (Larry Summers)*

The fact that at least four statistically "impossible" financial events occurred in just 20 years—in stock markets in 1987, bonds in 1994, currencies in 1998 and credit markets in 2008—would by normal standards, have meant the end of EMH. But as in the case of rational expectations, the facts were rejected while the theory continued to reign supreme, albeit with some recalibration. Similarly, the risk management models that underlay financial instruments were also highly flawed, failing to take into account tail-end risks, leverage, interconnectedness, and foreign currency exposure.

> *"... increasing tendancy to pursue theorizing like an intellectual game" (Blaug)*

> *To succeed, an idea need not be true or even useful, as long as it has what it takes to propagate itself (Krugman)*

> *"The emphasis on market failure by politicians who wanted to justify government intervention, was itself a testament to a faith in rational expectations and efficient markets. For explicit evidence of market failure, in the form of anti-competitive collusion or false information or some other distortion, came to be seen as a necessary precondition for any interference with market forces. In the absence of such explicit evidence of market failure it was taken as axiomatic that competitive markets would deliver rational and efficient results. (Kaletsky)*

> *Science progresses one funeral at a time (Planck)*

On the other hand, Economics has progressed from the 08 financial crisis. Behaviourial economics and Keynesian Fiscal policy has been greeted with renewed sailance. Several market failures have been revealed: information asymmetry, moral hazard, systemic risks, etc. It has prompted a fundamental re-think of the relationship between markets and governments. The contest is not just between economic theories but between competing systems of political economy and models of governance.

> *The crisis has "cast into doubt much of what we thought we knew about economics." (Barry Eichengreen)*

> *"Governments need the capability to step in when they can make things better, the humility to pull out when they are making things worse, and most of all, the wisdom to know the difference." (Ravi Menon, from Singapore's Ministry of Trade and Industry)*

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1.3 Economic Models

[Financial Crisis] In our hour of greatest need, societies around the world are left to grope in the dark without a theory. (Dahlem Report)

1.3.1 The Purpose Of Models

Conventionalism holds that all scientific theories are merely condensed descriptions of natural events, neither true nor false in themselves but simply conventions for storing empirical information (Mach). Perhaps we hope for more from Economic theories.

Much of economic theory is pursued for no better reason than its intellectual attraction; it is good game (Hicks)

Models week to simplify reality, to explain and to predict, in an internally-consistent and logical manner. The value of a model is not its literal veracity, but its generality and hence applicability to new situations. **Occam's Razor**: when you have two competing theories which make exactly the same predictions, the one that is simpler is the better.

"The ultimate goal of a positive science is the development of theory or hypothesis that yields valid and meaningful (i.e., not truistic) predictions about phenomena not yet observed. Such a theory is, in general, a complex intermixture of two elements. In part, it is a language designed to promote systematic and organized methods of reasoning. In part, it is a body of substantive hypotheses designed to abstract essential features of complex reality" (Friedman)

"Any theory that is not an exact replica of reality idealizes behaviour of economic actors and oversimplifies assumed initial conditions and is hence descriptively inaccurate. If simiplicity is a desirable criterion, all good theories idealise and oversimplify outrageously" (Friedman).

For instance, although Keynes' General Theory is extensive, it somehow seems incomplete as a matter of logic. Too many threads are left hanging. The ISLM model interprets Keynes. Some complain that it oversimplifies the economic vision offered by Keynes, but the whole point of the model was to simplify a line of argument that was otherwise hard to follow (Mankiw). Theory, explaining causal mechanisms, provides a deductive basis for inductive conclusions.

"A model is a powerful device for organizing our thoughts; it is not literally true; indeed it derives its power from the very fact that it is not literally true" (Leamer)

"Science is the art of systematic oversimplification; the art of discerning what we, with advantage, may omit" (Popper)

In their simplifications, models may conflict. In particular, how to reconcile the two visions of the economy – one founded on Adam Smith's invisible hand and Alfred Marshall's supply and demand curve, the other founded on Keyne's analysis of an economy suffering from insufficient aggregate demand – has been a profound nagging qn since macroeconomics began as a separate field of study.

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However, this may not be a problem, and may even in fact be good for discourse. Different models provide different perspectives, and are often prone to special biases (e.g. the feeling that perfect competition is an optimal situation).

- Mainstream models typically demonstrate an economic equilibrium
- Austrian economists emphasize uncertainty and question whether one should regard outcomes as equilibria, and are skeptical about the value of mathematical modeling
- Recent institutionalist economics emphasizes transaction costs and principal-agent problems
- Marxist economics inject Marxist notions of class struggle etc.
- Behavioral economists etc examine irrationality

The simplicity of models creates particular worries. Barry Eichengreen (2008) rightly points out that the "development of mathematical methods designed to quantify and hedge risk encouraged commercial banks, investment banks and hedge funds to use more leverage" as if the very use of the mathematical methods diminished the underlying risk. This is a **control illusion**, where the mathematical model and numerical precision of models conceals its weakness to those who have no developed them. Abstraction requires falsification to counter-check its veracity.

> *The Modeller's Hippocratic Oath: "I will remember that I didn't make the world, and it doesn't satisfy my equations, and I will never sacrifice reality for elegance without explaining why I have done so" (Derman and Wilmott)*
>
> *"Economists have mistaken beauty for truth" (Krugman)*

Applicability refers to the extent to which a model reflects forces operating; models may not be applicable under different scenarios, and may not yield accurate predictions. Rather than episteme, or epistemic knowledge, Economic models constitute phronesis, or **practical wisdom** requiring contextual judgement. Models have to live with complexity.

> *Economic man is an abstraction and hence the political economy is a science of tendencies only, not a matter of fact (Keynes)*
>
> *It is rarely possible to specify the magnitude of the change, but we must insist that as a minimum requirement we can determine the algebraic sign of the change (Samuelson)*
>
> *All we can hope to do is to discover o the basis of finite and imperfect knowledge what is the balance of probabilities between competing hypotheses (Lipsey)*
>
> *But what's almost certain is that economists will have to learn to live with messiness [or complexity] That is, they will have to acknowledge the importance of irrational and often unpredictable behaviour, face up to the often idiosyncratic imperfections of markets and accept that an elegant economic "theory of everything" is a long way off. (Krugman)*
>
> *"It is better to be approximately right than precisely wrong" (Keynes)*

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Meade's honey and bees story (see later) reminds us to be skeptical of what economist Ronald Coase called "**blackboard economics**" — abstract thought experiments that suggest market failure without any reference to or understanding of the particular institutional details of the market in question. It is the onus of those who apply the models to study the assumptions and verify if they hold under a given scenario.

> *"Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant to the contemporary world. It is compelled to be this, because, unlike the typical natural science, the material to which it is applied is, in too many respects, not homogeneous through time" (Robbins)*
>
> *"The actions of men are so various and uncertain that the best statement of tendencies must need be faulty and imprecise" (Marshall)*
>
> *Models can be put to be very different uses, what is designed as an instrument to hedge risk can be come a weapon of 'financial mass destruction' (Warren Buffett)*

Curiously, the very existence of a model can change the subject matter modeled. Goodhart's law suggests that once an indicator is made a policy target, then it becomes distorted and no longer conveys the necessary information accurately ("to control is to distort"). The Lucas Critique suggests that economic correlations may tend to collapse once they are explored for policy measures, since policy changes tend to modify the decision rules of economic agents under which the correlation is observed. For instance, once the Philips curve (an inverse relation between inflation and unemployment) was used for policy making, its relationship broke down and economies went into stagflation.

> *An eminent businessman who has just been told of recent developments in the economics of industry exclaimed: I feel like the character in Moliere who learns that he has all the while been speaking prose. (Vickers)*
>
> *Economic laws are not made by nature. They are made by men and we decide how the economy is to work (Roosevelt).*

Similarly, when propositions in economics frequently serve at one and the same time as explanations of behaviour and as stipulated norms for behaviour, they may simply be self-fulfilling prophecies deriving from a dynamic selection process that rewards the businessmen who act as if they were rational maximisers. Or, do they just describe what are the maximizing behaviours? Are economic forces bound to the will of economic agents?

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1.2.3 The Use Of Mathematics

Mathematics is an integral part of Economics. Statistical induction provides evidence for models, and makes for elegance and precision. Mathematical laws like the 'random walk' may model seemingly random stock-market fluctuations.

> *"The pure theory of economics is a physico-mathematical science like mechanics... Economists should not be afraid to use the methods and language of mathematics." (Walras)*

> *"It is necessary in order to examine the general conditions of economic equilibrium. It does not make demonstration more rigorous, but it permits us to treat problems far more complicated than those generally solved by ordinary logic" (Pareto)*

Mathematics is not without its flaws. Statistical inference can be too stringent or too lax, and 'fudge factors' are often introduced into econometric models for no logical reason.

> *"Was Adam Smith an economist? Was Keynes, Ricardo or Schumpeter? By the standards of today's academic economists, the answer is no. Smith, Ricardo and Keynes produced no mathematical models. Their work lacked the "analytical rigour" and precise deductive logic demanded by modern economics. If any of these giants of economics applied for a university job today, they would be rejected. As for their written work, it would not have a chance of acceptance in the Economic Journal or American Economic Review." (Kaletsky)*

> *Math is descriptive and not explanatory: accurately describing behaviour in mathematical terms, but what happens inside the system remains unknown... devoid of explanatory power in spite of its descriptive accuracy (Epstein)*

Mathematical elegance is tempting but also misleading and distracting. It may also gloss over the complex forces in the real-world.

> *"Modern economics is sick... a sort of social mathematics in which analytical rigour is everything and practical relevance is nothing." (Blaug)*

> *"Economics emphasizes technical puzzle-solving abilities at the expense of knowledge of the economic system: an empty formalism that has come to characterize the whole of economics" (Blaug)*

> *"The profession's failure was the desire for an all-encompassing, intellectually elegant approach that gave economists a chance to show off their mathematical prowess" (Krugman)*

> *"Not only will our successors have to be far less concerned with general laws than we have been, they will have to study complexity. Not for them the pleasure of theorems and proofs. Instead, the uncertain embrace of history, sociology and biology". (Hahn)*

> *Mathematical tractability soon came to be viewed as a more important academic objective than correspondence to reality or predictive power. Models based on rational expectations usually failed statistical tests. But this was not a deterrent. If the theory doesn't fit the facts, ignore the facts. (Kaletsky)*

That the exact precision of economic mathematics is also not necessarily a good thing:

> *A science can only be as precise as its subject matter (Aristotle)*

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Given this trade-off between analytical rigour and practical relevance,

> *"The most helpful applications of mathematics to economics are those which are short and simple, which employ few symbols; and which aim at throwing a bright light on some small part of the great economic movement rather than at representing its endless complexities" (Marshall)*

1.3.2 The Plausibility Of Assumptions

Assumptions are necessary to simplify reality, and often specify a range of intended applications. This is especially true in Economics, given its imprecise subject matter (1.1.3)

> *"[theories] are shadows of real problems, dressed up in such a way that by pure logic we may find solutions for them" (Hicks)*

The assumptions may not have to be realistic; what matters is robustness: that its predictions might hold true, albeit to a lesser extent, even if the assumptions are violated. Three kinds of robustness exist: (1) robustness to changes in the model's idealisations; (2) robustness to changes in the 'background' conditions; (3) robustness to changes in the implied causal mechanism. This view holds that theories should be appraised in relation to the accuracy of their predictions; perfect competition being held up as an example of a robust theory. Since we do not know the true model, robustness should be a key concern.

> *Plausible assumptions yield surprising conclusions to distil clear insights from seemingly murky issues (Krugman)*

> *Cannot rule out by assumption the existence of wage and price rigidities and the possibility that markets do not clear (Solow)*

One major assumption of most economic theories is that of rational economic man (after Mill). As a first approximation, economists abstract from difficulties caused by irrationality. In that way theorists need not worry about what people's beliefs are.

But once one goes beyond this first approximation, difficulties arise which have no parallel in the natural sciences. Choices depend on expectations, as in the stock market. The "true" value of a stock depends on the future profits of the company, but what matters in the short run, is what people believe. Keynes compares expectations to a beauty contest – what matters is guessing what other people guess. Henri Poincaré (1905) observed that it would not be sensible to take this model as a basis for analysing financial markets. As he said, individuals who are close to each other, as they are in a market, do not take independent decisions – they watch each other and "herd".

Rational economic man may be an overly romanticized vision, leading economists to ignore the limitations of human rationality that lead to bubbles and busts, market imperfections, and sudden crashes. It leaves no room for imperfect knowledge and adaptive adjustments. There is no one representative agent in economics, to assume such is to incur a fallacy of composition

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> *The axioms that are used to define "rationality" are based on the introspection of economists and not on the observed behaviour of individuals. Economists from Pareto through Hicks to Koopmans have long made this point. Thus we have wound up in the weird position of developing models that unjustifiably claim to be scientific because they are based on the idea that the economy behaves like a rational individual, when behavioural economics provides a wealth of evidence showing that the rationality in question has little or nothing to do with how people behave. (Kirman)*

An alternative may be Herbert's view of bounded rationality as constructive replacement for maximization under certainty. Herbert Simon holds man to be boundedly rational, displaying inertia in their reaction to new information and strongly influenced by emotional and hormonal reactions.

Ceteris Paribus is another assumption that commonly fails. A market participant (e.g. Long Term Capital Management) may become so dominant that ceteris paribus no longer holds. Ricardo's prediction that the increase in wages above subsistence level leads to population increase and necessitates more intensive cultivation, lowering profits and returning wages to subsistence levels, such that economic development is a gloomy stationary state in which profits remain low, wages remain at subsistence levels continued to hold sway for half a century with unfavourable data explained away due to 'disturbing causes'. While we cannot escape Ceteris Paribus, Hutchinson held that unspecified ceteris paribus clauses are tautologies.

Yet another assumption is the state of equilibrium, which holds in the long run. But as Keynes puts it, in the long run we are all dead.

'Hidden' assumptions may even be more dangerous. Friedman assumes the longrun trend is independent of the short-run trend in exclaiming that:

> *Destabilizing speculation cannot persist indefinitely, because it means that speculators sell when the price is low and pbuy when the price is high. Because speculation continues to exist in the real world, it must be profitable and therefore stabilizing. (Friedman)*

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1.3.3 Fallacies

1. Fallacy of composition / aggregation: The fallacy that what is true for one person must be true for the economy as a whole. Aggregating behaviour of rational individuals will not necessarily lead to behaviour consistent with that of a representative agent. (Sonnenschein-Mantel-Debreu results). Examples:

- Nash-equilibrium is privately rational but socially non-optimal
- Profit-maximization may be true for a theorized actor, but not for the economy in general; this neglects notions of systemic risk, communication breakdown, and coordination failure that we are now painfully aware of. (Dahlem Report)
- The Dow Jones crashed 1000 points in a day due to automated trading systems. Relevant actors could not realize attempted adjustments, but rather suffered major losses from the ensuring large macro effect

Hence it is necessary to have the micro foundations that considers interaction at a certain level of complexity and extract macro regularities from microeconomic models with dispersed activity

> *We cannot investigate "macroeconomic phenomena as an organism governed by a universal will" (Dahlem report)*

2. Post-hoc fallacy: The fallacy of inferring causation from mere conjunction; just because one event happened first, the first event must have caused the second event. We can never be sure causation is not simply correlation. (Hume). Examples: Money Supply growth and inflation

3. Other-conditions fallacy: The fallacy that if two events always occurred together in the past, they will always occur together in the future.

4. Misleading comparison: When two or more things are compared in a way that does not reflect their true difference

5. Selection bias: Selection bias occurs when people use data that are not typical but selected in a way that biases their results Financial models were estimated on data from periods of low volatility and thus could not deal with the arrival of major changes.

> *Torture the Data and it will confess (Coase)*

It may be hard to escape selection bias: all facts are theory-laden, by selecting certain observations we have already settled on a point of view. On the other hand, facts may have at least some independence from theories – they may be true although the theory in question is false, may be consistent at a lower level with a number of theories whose higher-level propositions conflict.

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2 The Markets & Commons

Syllabus objectives

- examine the problem of uncertainty and imperfect information, and attitudes to risk
- Optimal search with imperfect information
- examine the issue of asymmetric information in relation to problems of adverse selection, moral hazard and principal-agent problem in product, insurance and labour markets
- xamine and evaluate measures to counter problems of asymmetric information in particular, monitoring, signalling, screening and efficiency wages
- examine and contrast the various dimensions of efficiency (e.g. X-efficiency, productive, allocative, economic, dynamic, exchange efficiency)
- examine and contrast profitability, efficiency and welfare concepts
- examine the issue of common resources (the tragedy of the commons) and evaluate policy implications
- examine and evaluate the significance of clearly defined property rights in externalities and the issue of common resources
- examine and evaluate public provision of merit goods, extent of public subsidy vs private payment (i.e. distribution of payment burden), regulation of demerit goods in relation to efficiency and welfare effects
- examine and evaluate policies or measures (in particular the Coase solution and marketable permits) to regulate externalities

2.1 Risk & Uncertainty

2.1.1 Attitudes Towards Risk

Individuals hold differing attitudes towards risk. Risk-neutral individuals pay no attention to the degree of dispersion of possible outcomes, betting if average monetary profits exceeds zero. Risk-lovers will bet even when strict calculations reveal unfavourable odds. Risk-averse people will refuse a fair gamble, requiring more favourable odds to overcome the inherent dislike of risk. Diminishing marginal utility suggests that most people are risk-averse, refusing fair money gambles because they are not fair utility gambles: the extra utility of earning a given amount is less than the utility sacrificed in losing that amount.

The principle of insurance is risk-pooling: aggregating independent risks to reduce the dispersion of the aggregate outcome. This only works when the risk are spread over a large number of individuals, whose risks are independent of each other – hence 'acts of God' which affect many are typically not insured against. Risk-sharing reduces the stake of each individual party to minimize the difference between the marginal utility of a gain and that of a loss. Risks can also be hedged: shifted onto someone else through the use of forward markets, setting a price today for future delivery of and payment for goods, hence giving some certainty.

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In general, a larger risk has to be compensated for by a larger return. Diversification is the strategy of reducing risk by risk-pooling across several assets whose individual returns behave differently from each other. In particular, assets that tend to have a negative correlation with assets in the existing portfolio (negative beta) e.g. gold improve the risk-return characteristics of the portfolio. It is predicted that negative-beta shares will have high demand, as risk-averse purchasers anxiously bid up the price and reduce the average return.

The Efficient Markets Hypothesis holds that asset prices incorporate all existing information, and that there is no way of beating the market to earn an above-average return. The contradiction that some investors can earn more than others can be resolved by proposing that the first to react to newly-available information have a chance to earn extra. The alternative view is that the stock market is like a casino dominated by short-term speculators who buy purely to resell at a quick profit (Keynes); share prices reflecting what average opinion expects average opinion to be.

2.1.2 Market Behaviour With Imperfect Information

Optimal search with imperfect information (Stigler): Gathering consumer information incurs marginal cost, i.e. opportunity cost in terms of time. Optimal search equilibrium occurs where marginal benefit equals marginal costs, and usually does not entail full information. Search costs result in different prices for the same product, and quality differences among sellers, even for identically-priced products, because the marginal costs of finding a higher-quality product exceeds marginal benefit. High search cost consumers may pay more than low search cost consumers.

The extent of optimal search varies with several factors: The more expensive the item, the greater the price dispersion, and hence the greater marginal benefit of search. When earnings increase, so does the opportunity cost of time, resulting in less searching and more price dispersion. Technological changes that reduce the marginal cost of information (e.g. the internet) lower marginal cost of search, reducing price dispersion

The Winner's Curse: When competitive bidding is coupled with imperfect information, the winning bid is often an overly optimistic loser. This applies when the value of the item is not known at the outset (e.g. bids for radio frequencies). The winning bid is not the average bid, which may be the most reliable estimate, but the most optimistic estimate.

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2.1.3 Asymmetric Information

Adverse selection occurs when individuals on the informed side of the market self select in a way to harm those on the uninformed side of the market.

In insurance markets, buyers but not sellers can predict their likely need for insurance in future, so those who are more likely to benefit are more likely to accept than the general population. If those who are good health risks are charged the same price as those who are poor ones, the price of insurance will be attractive to poor ones but not good ones, some of whom will not buy insurance. The insured group becomes less healthy on average, so rates rise, making insurance even less attractive to healthy people.

In labour markets, a job applicant's true abilities are largely hidden characteristics; a given wages sounds the most attractive to those who least deserve it, so the employer ends up with a pool of applicants of below-average ability.

Prior to the 1970s, home mortgages were the most illiquid asset on a bank's balance sheet. Banks could not sell the mortgages on the secondary market due what is known as an "adverse selection" problem arising from asymmetric information. That is, buyers were afraid that banks, who knew their mortgages better, would sell only the bad mortgages and keep the better mortgages on their own balance sheets. Thus, prior to 1980, the vast majority of home mortgages were made by financial institutions who originated, serviced and held the loans in their portfolios—the "originate to hold" business model. In order to create a market for mortgages, in the 1970s "securitizers," which can be banks themselves but were more frequently investment banks, took pools of mortgages, had the pools of mortgages rated and then sold the pools of mortgages. The large pools of mortgages were typically divided into sections known as tranches, where each tranche offered differing risks or default. In the event of default, the losses are absorbed by the lowest priority investors before the investors with the higher priority claims are affected. These more complicated offerings were known as Collateralized Debt Obligations (CDOs). Over time, home mortgages were increasingly securitized—the "originate to distribute" business model. Crucially, this allowed loan originators to shift most of the risk to the secondary market for mortgages.

Akerloff's Lemons: suppose there are only two types of used car, good cars and lemons. Buyers do not know whether a given car is a good car or a lemon, only sellers do. It might seem that the average expected value of cars would become the market price of cars, however, the actions of sellers ensure otherwise. Sellers of good cars find the market price unfair, while sellers of lemons find it attractive, such that the proportion of lemons rises, reducing the market price of used cars, so even fewer good cars come onto the market. In general, when sellers have better information about a product's quality than buyers, lower-quality products dominate the market. The market can decay to the point of nonexistence.

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The Principal-Agent Problem: When the goals of the agent are incompatible with those of the principal and when the agent can pursue hidden actions. Hence financial advisors promote churning to maximize commissions, doctors order unnecessary tests, insurance agents push unsuitable products, and maid agencies promote the workers who have been sitting in their office the longest.

Moral hazard is a situation in which one party, as aresult of contract, has the incentive to alter their behaviour in a way that harms the other party by increasing the likelihood of an unfavourable outcome. This is a subset of the principal-agent problem that occurs because those on one side of a transaction have the incentive to shirk their responsibilities because the other side is unable to observe them.

The very act of insuring increases the likelihood of the occurrence of the unpleasant event insured against – those with life insurance are more likely to take up skydiving. Those with theft insurance may take less care of their valuables. Banks who are 'too big to fail', in the knowledge of governmental bailouts in crises, may take excessive risks, and individual bankers, paid on short-run profits, ignore long-run downsides. When rating agencies are paid for by banks, who have every incentive to award repeat business to rating agencies who give good ratings, moral hazard arises. Welfare payments make people more willing to lose their jobs, and welfare for unmarried mothers can mean that the best thing a poor black woman can do is to get pregnant multiple times.

Two types of moral hazard exist: ex ante moral hazard, in which insured parties behave in a more risky manner, and ex-post moral hazard, in which insured parties pay more negative consequences from risk as insurance coverage increases (e.g. people claim for medical treatments that they would not have undertaken without insurance)

It is usually the case that the seller has more information than the buyer but the exception to this rule is antique markets, in which expert buyers often have the upper hand.

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2.1.4 Measures To Counter Asymmetric Information

The internet has resulted in a decline in asymmetric information as unknowledgeable users can more acquire information e.g. the costs of competing insurance policies.

Insurers require applicants to disclose medical history, and preexisting medical conditions may not be covered. Adverse selection can be avoided by covering groups (e.g. company employees), not just those who self-select. Deductibles, non-claim bonuses, and the threat of increase premiums reduce moral hazard by ensuring that both parties incur costs when the unfavourable event occurs. Price discrimination between low and high-risk individuals is also carried out, e.g. red curs are more expensive to insure, but this poses issues of fairness: it may not be fair to charge some individuals unaffordable premiums simply because of unfavourable genetic predispositions.

Signalling (Spence) is an attempt by the informed side of the market to communicate information about unobservable characteristics that the other side would find valuable, so as to resolve the information asymmetry. Signals are often proxies. A credible signal is one that can only be sent by some; a signal that can be sent by everyone does not provide useful information. An example would be education, even if education does not affect productivity, good-type employees pay less opportunity cost for one unit of education than bad-type employees, so employers condition their wages on the signal, offering better wages to those who had invested more in the signal. Problems arise if the signal is fraudulent. Also, positional externalities may arise (section 2.4).

Screening (Stiglitz) is the attempt by the uninformed side of the market to uncover relevant but hidden characteristics. Examples: banks screen potential borrowers for financial history and job security, firms interview workers.

Monitoring means continual assessment during an ongoing contract, e.g. insurance or employment. This is particularly salient in the labour market, taking the form of direct performance evaluations, piece rates, profit-sharing etc, and providing incentives for good performance. The Informativeness Principle (Holmstrom) states that common background noise factors e.g. demand fluctuations should be filtered out, so a greater proportion of the agent's income fluctuation falls under his control.

Monitoring encounters problems. Goodhart's law holds that to control is to distort, and choosing proxies that are a subset of relevant tasks to monitor may mean that the proxies, not overall performance, are targeted, and non-rewarded tasks neglected. Individual performance pay destroys psycho-social compensation, reduces incentives to collaborate with co-workers (but team bonuses may solve this). Subjective performance evaluation shifts efforts from useful and constructive tasks to those that give the appearance of being useful and constructive. Centrality bias, where supervisors become reluctant to distinguish critically between workers, and leniency bias, where supervisors are averse to offering poor ratings, have been documented. The more difficult it is to completely specify and measure the variables on which reward is to be conditioned, the less likely performance pay will be used.

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"In essence, complex jobs will typically not be evaluated through explicit contracts" (Prendergast)

Indirect incentives, surmounting this problem, include deferred compensation, in which compensation is weighed to later periods, where better and poorer workers have been distinguish. Seniority wages are commonplace. Tournament theory (Lazear) states firms motivate workers to supply effort by the wage increase they would earn if they win a promotion, and this requires not absolute performance evaluation, but ranking workers relative to others. Tournaments also reduce danger of rent-seeking, because supervisors will suffer if they do not promote the most qualified person.

Effort incentives are better the less noise in the luck element (Vickers)

Efficiency wages are when employers pay above market-clearing wages to increase productivity through several mechanisms. Empirically, Ford's five-dollar day significantly increased productivity and profts, lowering turnover and increasing morale.

The resultant equilibrium unemployment disincentives shirking by creating higher opportunity costs to unemployment, in other words, unemployment plays a socially valuable role in creating incentives. Seniority wages provide incentives to avoid shirking while allowing present value of wages to fall to equilibrium level, but may provide incentives to fire older workers, and shifts moral hazard to employers. The equilibrium unemployment also minimizes labour turnover.

Efficiency wages also correct for adverse selection: low-wage firms attract only low-ability workers, but high-wage firms can attract workers of all abilities.

Screening, signaling, and efficiency wages do not exist in all labour markets, however. The greater the heterogeneity of labour, and the greater the dependence of productivity on employee initiative and effort, the more significant the problem of asymmetric information, and hence more screening, signaling, and efficiency wages will occur. Hence we see employers of unskilled labour taking in whoever they can find without too many questions. Some equilibrium, unique to each industry, is reached at which the marginal cost of screening, signaling, and efficiency wages equals the marginal benefit. Secondary labour markets, characterized by short-time employment relationships, have less of these. Also, firms probably spend less effort in the recruitment process if monitoring employees is easier later on. Anyone can easily become a real estate or insurance agent –even if many lemons join, the firm does not lose much, since with little basic pay, the lemons will make few sales and pocket little commission. All this makes economic sense.

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2.2 Efficiency, Profitability, Welfare

> *The success of the market does not preclude the need for fruitful and efficient action (Amartya Sen)*
>
> *"The most difficult issues of public policy are those where the goals of equality, freedom of choice and efficiency conflict." (Tobin)*

Welfare economics evaluates economic well-being, with respect to efficiency and equity. The Chicago tradition views economics through the lens of price theory, while the Austrian school places emphasis on dynamic competition by innovation and threat of entry. Numerous efficiency criterions exist

- **Productive efficiency** (as per the H2 syllabus), including X-efficiency (Leibenstein) due to a lack of competitive pressure

  > *"the best of all monopoly profits is an easy life" (Hicks)*

- **Allocative efficiency** (as per H2 sullabus). However, Leibenstein claims allocative inefficiency is insignificant as studies show that about 0.01% to 0.07% of GNP is lost from resource misallocation due to monopoly

- **Exchange efficiency**, i.e. no mutually advantageous trades available. This does not distinguish between 'higher' and 'lesser' goals, or say anything about equity

- **Dynamic efficiency:** effieiency, taking into account technological and process changes over time. This stands in contrast to static efficiency concepts and often comes at a trade-off.

- **Pareto efficiency** i.e. no party can be made better off without someone else being made worse off. However this is a somewhat restrictive criterion.

- **Kaldor-Hicks efficiency**: an outcome is more efficient if those who are made better off can sufficiently compensate those that are made worse off so that all would end up no worse off than before. This is the principle behind cost-benefit analysis. Pareto efficiency is a subset of Kaldor-Hicks efficiency.

While simple supply-demand analysis of some markets is a form of partial equilibrium, general equilibrium studies supply and demand in multiple markets, proving that equilirium prices in all markets exist. The Walrasian welfare theorems hold that any competitive equlibrium leads to an efficient allocation of resources, and any efficient allocation can be sustained by a competitive equilibrium. However, if uncertainties or incomplete markets exist, i.e. trade is not planned at the beginning of time but is instead conducted in spot markets, no general equilibrium and no pareto-optimality may exist.

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2.3 Public Goods

2.3.1 The public good – private good continuum

Pure public goods are both non-rivalrous and non-excludable. They face a missing market, subject to the free-rider problem that nobody has an incentive to pay because those who do not pay cannot be excluded, necessitating governmental provision or some other solution.

	Excludable	Non-excludable
Rivalrous	Private goods	Common goods
Non-rivalrous	Club goods	Public goods

Pure public goods are few are far between. Many goods, like roads, are partially rivalrous: where the good is non-rivalrous up to capacity, partially rivalrous over a range of use in excess of normal capacity, and fully rivalrous at absolute capacity. Many other goods are possible to exclude at some cost, e.g. building a fence around the grand canyon. Club goods take this route. However, exclusion may be inefficient as those who value the good more than the cost of allowing them to consume it may be excluded. Common-pool resources are dealt with in section 2.4.

2.3.2 Policy Options

The Pareto-efficient Lindahl equilibrium holds where there is a balance between people's demand for public goods and the tax shares that each must pay for them, i.e. citizens vote for goods they want, and then taxation is compulsory.

Unfortunately, Lindahl taxation requires knowledge of the demand functions for each individual, giving rise to a "preference revelation problem" if this information has to be extracted from the individual. Each person can lower his or her tax cost by under reporting their benefits from the public service i.e. Lindahl taxation is not incentive compatible. Incentives to understate one's true benefits under Lindahl taxation resemble those of a Prisoner's dilemma, and people will be inclined to misrepresent their demand for the public service. In principle, preference revelation mechanisms (e.g. Vickrey-Clarke-Groves) can be used to address that problem, although none of these have been shown to completely solve the problem.

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While the standard solution to a public good is governmental provision, this may not be necessary. Public goods may still be produced if a single party benefits more from the public good than it costs him to produce it, e.g. the businessman who erects a street light in front of his shop to attract customers. They may be produced if the profit incentive for free riding is eliminated by buying out all possible free riders e.g. a property developer who owns the entire street. Collective action may be inspired in the case of clearly-defined social norms. In this repeated game, the Nash equilibrium where nobody contributes is rarely seen, "people do tend to add something to the pot"

"If men were angels, then no government is necessary" (Madison)

Finally, the private-collective model of innovation explains the creation of public goods through private funding e.g. open source software, a public good to which technology firms are shown to invest substantially, because the innovators benefit through the process of creating the public good e.g. the technology firms' proprietary 'flagship' software tools used to create the open source software benefit.

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2.4 Externalities & Common Resources

2.4.1 Externalities

Standard economic theory states that any voluntary exchange is mutually beneficial to both parties involved in the trade. However, externalities may affect third parties. Apart from the usual positive and negative externalities, there may be two interesting cases:

Positional externalities arise where utility depends on the relative rankings of actors. One example would be conspicuous consumption ('keeping up with the Jones') where relative consumption and not absolute consumption is valued. This also arises in the phenomenon in 'over-education' as a signal of labour quality. (Might athletic events be subject to the same positional externalities?) This is a zero sum game, in that any gain made by one person is exactly offset by losses to another, and may be economically inefficient as consumption is pushed beyond the optimal outcome.

Pecuniary externalities indirectly affect third parties by changing prices. For instance, a property tycoon may buy up a large no. of houses in a town, causing prices to rise and excluding others from the housing market. Many economists do not accept the concept of pecuniary externalities, attributing such problems to anti-competitive behaviour instead. Marxists see externalities of all kinds, including pecuniary ones, as ubiquitous, being the rule rather than the exception - Production is totally interdependent.

2.4.2 The Tragedy Of The Commons

For a common pool resource, more than one individual has access, but each person's consumption reduces availability of the resource to others (i.e. excludability). This gives rise to the tragedy of the commons (Garret Hardin).

The original example involved cattle owners grazing on a lush 'commons'. It is to be expected that each herdsman will try to keep as many cattle as possible on the commons. As a rational being, each herdsman seeks to maximize his gain. Since his gains are concentrated on himself (he receives all the proceeds from the additional animal) but the costs diffused (the effects of overgrazing are shared by all the herdsmen), the rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd, and another, and another. The dominant strategy is 'graze a lot. But this is the conclusion reached by each and every rational herdsman sharing a commons. Therein is the tragedy.

Payoff [A,B]		**Owner B**	
		Graze a little	Graze a lot
Owner A	Graze a little	30, 30	5, 40
	Graze a lot	40, 5	15, 15

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The issue is made worse due to the **bandwagon effect** in consumption i.e. the tendency to change one's taste and preference pattern in favor of a particular product in some positive relationship with total demand for that product. (On the other hand, the **snob effect** works in reverse, where consumers derive utility from exclusivity, not conformity.)

Concentrated gains, diffuse costs: This tragedy is relevant in scenarios where external costs are diffuse, e.g. global warming, global financial regulation. In particular, public choice theory explains that producers who receive concentrated gains are more effective at lobbying for their interests than those who suffer diffuse losses, who suffer from a free-rider problem that limits their contributions to lobbying. This may explain the regulatory failure to regulate Freddie and Fannie in the run-up to the 2008 global financial crisis

2.4.2 Pigouvian Taxes

Pigouvian taxes leave the market to sort out the most efficient methods of pollution control, and complex regulatory oversight is unnecessary. This is theoretically sound, but hard to translate into a consistent and coherent policy: "the impossible task of politics" (Begg). Textbook examples are special cases. When a large number of individuals and firms are affected, it is complex to establish cooperative action when the costs to each are small relative to enforcement and action costs.

> *"Much existing literature focuses on externalities as special cases in otherwise perfect markets. In practice, market failures rarely arise in neatly segmented boxes. Externalities arise in oligopolistic and monopolistic markets, where there is risk, uncertainty and public goods." (Helm)*

Problems: Complexities also arise from the fact that most environmental assets are not marketed, and policy necessitates that values are placed on non-marketed goods. A distinctive feature of global externalities is the requirement for international cooperative solutions. Environmental consequences do not respect national boundaries but generational international law is too weak to provide adequate remedies.

Pigouvian taxes are complicated in markets with joint failures (e.g. monopolistic). This approach is informationally demanding, while cost functions and damage functions (given uncertain pollution impacts) are unknown. . Many goods produced by polluting technologies are merit goods, e.g. electricity, transport, water. Tax-based solutions of international externalities are best dealt with consistently at the international level.

Where nationalized industries are involved, the more substantial the environmental impact of long-term investments, the greater the impact of privatization. When investment is environmentally benign, privatization may only be beneficial if static efficiency gains are large. When investment is environmentally damaging, the balance goes the other way. The impact on regulation is also important – the intuitive answer is that greater control is engendered through ownership, and regulatory capture avoided, but if governmental regulators also own the polluter, principal-agent problems may creep in.

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Government failure: Market failure only justifies intervention if the costs of the failure exceed the costs of government intervention. Friedman believed that governments will not allocate resources any more efficiently than firms. A curious example: Consider a bee farm next to an apple orchard. Conventional wisdom held that governments should subsidise beefarms due to their positive externality i.e. helping to pollinate the orchard. Steven Cheung, however, found well-developed markets where beekeepers and apple growers regularly contracted for each other's services, "internalizing" the externalities Meade's 'blackboard economics' assumed would occur. Unfortunately policymakers have ignored this and the US has run a "US Honey Programme" for 5 decades.

2.4.3 The Coase Theorem

The **Coase Theorem** states that given well-defined property rights, low bargaining costs, perfect competition, perfect information and the absence of wealth and income effects, resources will be used efficiently and identically regardless of who owns them. Either the polluter pays compensation, or the affected party bribes the polluter to reduce emissions, both are efficient outcomes but are of distributional concern. The problem of externalities is hence the absence of property rights and hence markets.

In the case of fishermen and a polluting factory, should the fishermen own the lake, the factory could buy pollution-cleaning equipment, or compensate the fishermen for damages. Should the factory own the lake, the fishermen could buy the equipment, or absorb the loss if the cost of cleaning the pollution outweighs the loss.

Elinor Ostrom found empirical evidence that retaining the resource as common property and letting users create their own system of governance does not necessarily imply a 'tragedy'. People are trapped by the Prisoner's Dilemma only if they treat themselves as prisoners by passively accepting the suboptimum strategy the dilemma locks them into. Under repeated games, full cooperation may be feasible (see 2.4.5). e.g. contracts, punishing mechanisms. This resonates with Peter Kollock's taxonomy of strategies for dealing with social dilemmas - one strategy is to change the rules of the game. However, cooperation becomes more difficult as the size of the group of users increases, or as users' time horizon decreases due to eg migration.

Various design principles are important:

- rules should clearly define who has what entitlement
- adequate conflict resolution mechanisms are necessary
- the individual's duty to maintain the resource should be in proportion to the benefits.
- Decision processes should be democratic.
- It is easier to build up from small local commons to larger global commons.
- Purely symbolic sanctions can be almost as effective as monetary sanctions due to fear of explicit disapproval. This requires a more nuanced understanding of motives

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2.4.4 Problems With The Coase Theorem

1. Uncertainties in the initial allocation: It is uncertain how many carbon credits should be given out, scientific literature is contentious, and improper determination of the right limits create inefficiency. The EU carbon prices crashed in 2007 after it was clear that too many credits have been given out.

2. Transaction costs: Transaction costs come in the form of negotiation costs, search and information costs, enclosure costs, monitoring costs, prosecution costs for violators. If carbon credits were assigned to each individual, it would be impossible for firms to negotiate with everyone to trade credits. Individuals may have perverse incentives to hold out for more compensation, or wait for others to bear the burden of transaction costs and free-ride on the efforts of others (e.g. with one large pollutive factory and a thousand small landowners)

If these costs exceed the benefits, then the agreement will not happen, and the initial allocation of property rights becomes significant to efficient working of markets. Transaction costs can create a tragedy of the anticommons, where resources are hoarded and used inefficiently (Michael Heller).

> *The world of zero transaction costs has often be described as a Coasian world. Nothing could be further from the truth. It is the world of modern economic theory, one which I was hoping persuade economists to leave – Coase.*

Coase himself concedes that a world of zero transaction costs is a very unrealistic assumption. Alternatively, governmental action can focus on lowering transaction costs: it would be prudent to assign property rights in a way to minimize transaction costs (e.g. to countries rather than individuals) to facilitate Coasian bargaining

3. Monitoring costs: Ensuring adherence to property rights can be prohibitively difficult. It would be difficult to ensure that each country sticks to assigned limits, and accurately report carbon emissions. China is accused of under-reporting emissions.

4. Equity: While the outcome might be efficient whoever receives the initial allocation of property rights, this allocation is of non-trivial consequences, as it determines who receives payment and compensation. It seems unfair if sufferers have to pay rights holders to minimize pollution. Ripple effects mean that not just the individual, but the whole community pays. That the initial allocation may be prone to political maneuvers e.g. industry lobbies exacerbates the situation

> *"The murder victim too, is then always in accessory to the crime" (Baumol)*

5. Property rights may be irrelevant: The population explosion is a good example. Scientists attribute most of our environmental problems to the world's burgeoning population, which places ever greater demands on the environment's limited resources. The cause of the population explosion is science and technology, which have resolved many problems of scarcity and increased the "carrying capacity" of the land. Strengthening property rights would hardly affect this trend.

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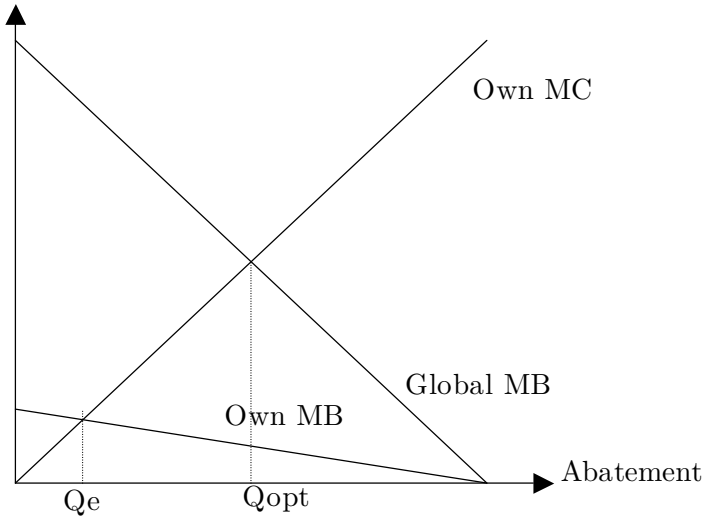
2.4.5 Global Environmental Action

Global optimality demands global cooperation but the incentives facing individual countries work in the opposite direction. One successful example of global environmental action has been the Montreal protocol.

> *"Perhaps the single most successful international agreement to date has been the Montreal Protocol" (Kofi Annan).*

CFC reduction (**Montreal protocol**) was easier because of the smaller no of players, small no of potentially interested parties, and lower costs of substituting CFCs. It also falls into the category of 'harzardous pollutants that are cheap to control' i.e. smaller own MC, in which case the market failure is smaller (less divergence between Qopt and Qe). However, this is not so for the current major environmental concerns. The market failure is greater for harzardous pollutants that are expensive to control, or mildly offensive pollutants that can be controlled at little costs, for which Qopt diverges from Qe more greatly.



In designing a solution, one principle is that cooperation should be **efficient** i.e. marginal abatement costs of every signatory being equal to minimise the total cost of abatement. Hence a flat % reduction obligation or quota may be inefficient because at the margin the costs of complying vary, e.g. those who start from a higher base face cheaper compliance.

Cap-and-trade schemes, under which polluters will each receive permits according to their emissions at some baseline date, fulfill this criteria. Polluters with lower abatement costs than the market price of permits will cut emissions further, selling permits to gain a profit, while polluters with high abatement costs will buy permits. Hence abatement is concentrated on low-abatement cost polluters, minimizing compliance costs.

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Cap-and-trade is a **quantity mechanism** as opposed to a **price mechanism**. While price mechanisms offer certainty in the price of the permit, which can spur investment into alternative technologies given lower risks, quantity mechanisms offer certainty in the overall emission level, which may be more important if the risk of exceeding a given level is very high. Alternatively, hybrid mechanisms can be implemented, e.g. where governments are committed to sell extra permits at a price ceiling, or buy surplus permits at a price floor, providing a safety valve to pure quantity mechanisms.

While the individual country faces problems of concentrated costs and diffuse gains, under this repeated game, countries may choose **trigger strategies** (tacit cooperation), i.e. choose Qopt initially and continue Qopt if all other countries choose Qopt in every previous period.

Cooperation by a subset of countries in the face of free-riding by others may be possible (Sugden) e.g. industralized countries cooperate to reduce CFC emissions and poorer countries allowed to free-ride, where the members of the subset (industralized countries) adopt the trigger strategy with respect to subset, while the rest are allowed to choose Qe responses. But this possibility is fragile because different countries may have ifferent views about who should be in the subset.

Alternatively, countries may adopt **matching strategies**: choose base abatement level and a matching rate: e.g. a fraction of the sum of all other countries' base abatement levels. In practice, some variant of this happens: it is common for treaties to come into force after minimum no of ratifications.

Under such strategies, agreements may be self-reinforcing: any signatory that renounces its commitment reduces its abatement costs, but loses benefits from remaining cooperators reducing abatement levels.

The gains from a global agreement depends on no. of signatories vs the no. of potential signatories. If too small a proportion sign, the effect on global levels is small. But where the no. of emitters is small (e.g. nuclear) the welfare of non-emitting countries may not be taken into account. The greater the no. of participants, the weaker or more ambiguuous its provisions are will be since they reflect compromises.

Side payments by signatories to a subset of non-cooperators can encourage them to sign the agreement and improve global welfare. Montreal protocol created a fund to compensate poor countries for compliance costs, helping it sustain nearly full participation.

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Problems resulting:

1. **Developing countries' initial allocation:** Developing countries will acquire fairly low initial allocation given low pollution base. One solution is to bias initial allocations to developing countries based on e.g. pollution, implying funds transfer to the third world. Permit trading could be subject to conditions e.g. agreed proportions being used for conservation expenditure, offsets e.g. afforestation covering additions to emission allowances.

2. **Equity of side-payments:** Idea that the optimality of the outcome is unaffected by who pays is much exploited. Those who gain by cooperation must devise incentives to make those whose lose play the game – i.e. issue side payments to induce those who stand little to gain to play the game. EG technology transfers to third world countries to reduce emissions.

> *Victim pay polluter is a stark reality in international environmental policy (Maler).*

3. It is possible that few countries will commit to an agreement unless they already intended to take substantial unilateral action. While Ostrom's economic governance principle held that it is easier to build up from small local commons to larger global commons, contributing may remove the 'need' others see to contribute

> *Unilaterial 'unselfish' action may undermine others' incentive to contribute, and can lead to greater emissions than the selfish case (Hoel).*

4. **Discounting** in the environmental context is contentious because it justifies shifting environmental costs to future generations. The first-best solution is the downward adjustment of discount rates, perhaps to zero to reflect indifference, or negative if society is risk averse. It is not clear who is bargaining on behalf of the next generation.

5. A clean environment is a public good and hence there is the incentive to hold out for more compensation, or wait for others to bear the burden of transaction costs

6. Pollution may be **concentrated** in certain areas, and if damage increases exponentially with pollution, then damage under a cap and trade system may exceed that under a simple tax.

7. The uncoordinated implementation of carbon taxes could lead to a situation where companies simply move their operations to countries that allow more carbon to be emitted. (**a race to the bottom**) To prevent this, the carbon penalty has to be imposed equally in all countries and across all economic sectors.

8. One argument in favour of such a tax is that it would help mitigate the costs of developing alternative energy sources such as solar. However, going by the International Energy Agency's Projected Costs of Generating Electricity study, such a tax will not make solar energy cost-competitive any time soon, given the current state of the technology.

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2.5 Equality And Wage Differentials

2.5.1 Economics and Equality

While some economists, notably Friedman, take a hard line on equity, there is a economic case to be made for equity in terms of diminishing marginal utility of money, i.e. every additional dollar is worth more to the poor than to the rich.

> *A dollar is a dollar is a dollar, whether it is to a beggar or to Bill Gates (Friedman)*
>
> *The transference of income from the rich to the poor would enable more intense wants to be satisfied at the expense of less intense wants, hence increasing utility (Pigou).*

There are both practical i.e. developmental impetuses for equity, and moral ones. These have been studies, in particular, by Amartya Sen.

> *Inequality stands as a complex of inhibitions and obstacles to growth and development (Myrdal)*
>
> *The reduction of poverty and the removal of inequalities are the hallmarks of a civilized society (Lim Chong Yah)*
>
> *Capitalism was condemned ethically long before it was doomed economically. (Solzhenitsyn)*

2.5.2 Explaining Wage Differentials

There are two distinct types of wage differentials:

Disequilibrium differentials are brought about by circumstances such as the growth of one industry and the decline of another. These differentials are a mechanism that leads to a reallocation of labour, to the extent that labour is occupationally mobile, which then eliminate the differentials, and in theory should not persist in the log-run. However such differentials may persist if labour is occupationally immobile.

Equilibrium differentials can be explained by intrinsic differences between different workers, e.g. their skills and abilities. This may be the outcome of individual differences in the choices of investment in education and training, hence they reflect different costs of acquiring skills and the different non-wage benefits of different occupations. Technological change and specialized production strategies tend to favour skilled and educated workers. These differentials reward people for accepting unpleasant working conditions, and are a quasi-rent (see 3.1) to compensate for the opportunity cost of skill acquisition. These may be economically efficient; policies that attempt to eliminate such equilibrium differentials will encounter severe difficulties.

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However, not all equilibrium differentials are of that sort. Wage differentials may also be due to the relative market power of firms and workers in a given industry, i.e. industries with powerful unions tend to have higher pay and better benefits. New forms of work organization, e.g. contract work, cut costs at the expense of job security, training opportunities, career advancement prospects, and inadequate sickness / maternity protection. There may be other non-economic reasons:

> *Executive pay is a function not of markets, it is a function of tradition, hierarchy of position, and bureaucratic power. (Galbraith)*

The **gender wage gap** has been explained away by the fact that women are more likely than men to have breaks from paid work e.g. maternity, which impact the level of work experience, implying that only a small part of the gender pay gap is due to sex discrimination. On the other hand, it may be that women's employment choices are more constrained than men's.

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3 The Interactions Of Firms

Syllaubus objectives:

- examine strategies of firms, namely advertising, research and development, innovation, outsourcing, patents and other entry limiting behaviour, and their impact on profitability, efficiency and welfare
- examine and evaluate game theory strategies with application of prisoners' dilemma and Nash equilibrium to oligopolies, advertising, research and development, and common resources

3.1 Nature Of The Firm

3.1.1 Purpose Of The Firm

Coase describes how firms exist because they minimize **transaction costs** between disparate economic agents. Organizing activities through the firm is more efficient than market exchange because production requires the coordination of many actions. Building on Coase's arguments, Williamson illustrates how markets and firms are alternative governance structures, which differ in how they resolve conflicts of differences i.e. through price bargainng, or through authority structures. While markets invite haggling and transaction costs, authority in firms can be abused and rent extracted in inefficient ways.

The inefficiency of markets may arise through inefficient bargaining e.g. strategies like selective or distorted information disclosure, self-disbelieved threats and promises. The **hold-up problem** ensues when parties are obliged to make large relationship-specific investments. For instance, if a supplier must invest in highly relationship-specific machinery to serve a particular customer, and the terms of trade can only be determined after the supplier invests, the supplier might worry that during post-investment price-negotiations, the customer, who now has bargaining power since the investment constitutes a sunk cost, renegotiates terms to his own advantage. On the other hand, reputation can substitute for contracts (Kreps).

Conducting transactions through a firm instead of via markets is more likely the greater the mutual dependence of the parties, the complexity of the transaction (hence it is easier to economize on transaction costs through centralized control), and the **relationship-specificity** of physical and human assets (e.g. investing in specific machinery to serve a particular customer only). On the other hand, firms are more likely to outsource if this reduces costs, the production task is well defined and quality easily observable, and many suppliers of the task keep costs down. Empirically, it is found that the further away a mine/generator pair is located from other mines and generators, the greater is the likelihood that the pair is jointly owned. This perspective challenges the position that vertical integration is best understood as a means of acquiring market power; it may simply increase economic efficiency.

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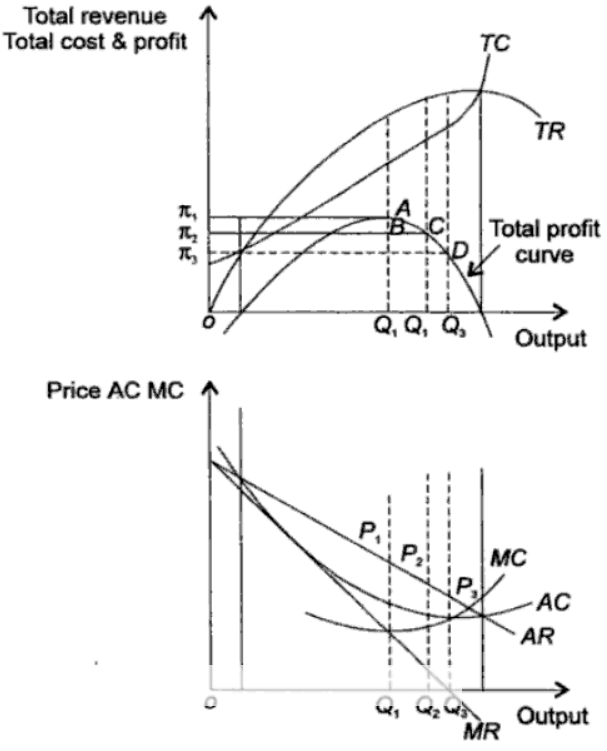
3.1.2 How Firms Operate

Classical economic theories assume rational **profit-maximisation** with perfect information. However that is at best an approximation of the real processes within firms.

Firms may not be rational. Rationality of individuals is limited by the information they have, the cognitive limitations of their minds, and the finite amount of time they have to make decisions; individuals may be at best **boundedly rational** (Simon), especially in the face of structural uncertainty. Firms may be procedurally rational, learning from past lessons to establish general behavorial rules, developing more efficient routines over time in an evolutionary manner.

Firms may not be solely profit-maximisers. The notion of 'profit' itself may be arbitrary, e.g. valuation of unsold stock, depreciation etc. Firms may maximize revenues subject to a **minimum profit constraint** (Baumol), especially where sales accord market power and prestige. Firms may **maximize growth** (Baumol), subject to managerial security constraints (Marris) i.e. a debt/equity ratio sufficiently high to support growth but not too high so as to be risky. Firms may maximize value. All of these can simply be long-run versions of profit maximization.



Alternatively, the **principal-agent problem** arises due to separation of ownership and control and provision of discretion to managers, such that managers may maximize their own utility, in the form of salary, no. of personnel who report to him, etc (Williamson), subject to minimum **profit-satisfying criteria** (Simon). Where managers seek to maximize life-time earnings, they may be risk averse (Monsen).

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Firms may have multiple operational objectives (Cyert, March): Production, inventory, sales, market share, profit. Behaviourial theory suggests conflicts between goals and conflict resolution mechanisms involving uncertainty avoidance, organizational learning etc. The objectives of firms depend on its ownership and managerial structure.

3.1.3 Introduction To Game Theory Approaches

Game theory (von Neumann and Morgenstern) examines the actions of interdependent firms. Central to a player's strategy is his expectations about the other's choices. But sometimes a player has a **dominant strategy** that is best irrespective of what the others do. A situation in which each player is choosing the best strategy available to him, given the strategies chosen by other players, is a **Nash Equilibrium**. Nash equilibrium corresponds to the idea of self-fulfilled expectations – a tacit, self-supporting agreement that requires no external enforcement mechanism.

> *"A strategic move is one that influences the other person's choice, in a manner favourable to one self, by affecting the other person's expectation of how oneself will behave" - Schelling*

Apart from dominant strategies, firms may choose **maximin strategies** i.e. minimizing the worst-possible outcome when concerned about the rationality of other player. Where multiple equilibria exist, the outcome mauy be difficult to predict (Nicholson: battle of the sexes). Strategies may be more complex in repeated games (see later).

3.1.4 Rents and Quasi-Rents

Rent, i.e. earnings in excess of opportunity cost, are often regarded as useless inefficiencies. Hence the traditional views on non-perfectly competitive market structures.

There are, however, **quasi-rents** that are a necessary incentive for something e.g. patents to reward innovation, higher wages to compensate for investment in education, or supernormal profits to protect variety (excess capacity). When products are heterogeneous, there is room to charge above opportunity cost; but the incentive effect of this "breathing space" is to encourage the satisfaction of consumers' diverse tastes. Of course, it would be more efficient to pay a one-time, lump-sum "bounty," and then price the product at opportunity cost; but that usually isn't workable.

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3.2 Competitive Strategies

3.2.1 Advertising

Advertising is mass paid communication to impart information, develop attitudes and induce action beneficial to advertiser. It may be any expenditure which influences shape/position of firm's demand curve (Dorfman).

Advertising takes advantage of imperfect information. The amount of advertisements reflects equilibrium between MB and MC, with greater advertising for experience goods (which can only been evaluated effectively after purchase) than search goods (which can be evaluated effectively before purchase). Cigarette Manufacturers endorsed advertising bans in Nevada in 1970, because they knew this would reduce costs and increase profits

Advertising serves a dual function: persuasion (Kaldor) and information provision (Stigler) especially when there are search costs. In the former case, advertising represents competition between firms, distorting consumer preferences, and may lead to more concentrated markets where advertising economies of scale exist (strong positive correlation found by Gutu), and deter entrants (Chamberlin). Market concentration may be a good or bad thing, depending on scale economies. On the other hand, advertising may just reduce transaction costs, and facilitate entry as new firms can make potential customers aware of their existence. Kwoka found that quality was higher in markets that allowed advertising.

> *"Doing business without advertising is like winking at a girl in the dark. Nobody knows what the hell you are doing". (Britt)*

3.2.2 Product Differentiation

Hotelling product differentiation: assume sellers of closely-related products are positioned at points along a line (of distance or degree of sweetness, colour etc) along which consumers are distributed. Consumers prefer to patronize sellers close to them (travel costs), but may be prepared to pay premiums to obtain their favourite variety. Hotelling's law predicts that a street with two shops will also find both shops right next to each other at the same halfway point. Each shop will serve half the market; one will draw customers from the north, the other all customers from the south. Obviously, it would be more socially beneficial if the shops separated themselves and moved to one quarter of the way along the street from each end — each would still draw half of the customers (the northern or southern half) and the customers would enjoy a shorter travel distance. However, neither shop would be willing to do this independently, as it would then allow the other shop to relocate and capture more than half the market.

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The original model assumes that each consumer along the street will consume at least a minimum number of goods sold in the shops, and that the price of these goods are fixed by an external authority. When these assumptions are not met, companies have incentives to differentiate their products. When not all people along the street, or along the range of possible different product positions, consume a minimum number of goods, companies can position their products to sections where consumers exist to maximize profit; this will often mean that companies will position themselves in different sections of the street, occupying niche markets. When prices are not fixed, companies can modify their prices to compete for customers; in those cases it is in the company's best interest to differentiate themselves as far away from each other as possible so they face less competition from each other. Increasing product differentiation results in lower price competition and increased prices

3.2.3 Evaluation Of Competition

Price-cutting can be in some circumstances be anti-competitive: predatory pricing to drive out rivals, or low prices seeking to mislead entrants (limit pricing). Non-price competition and differentiation is quite important. It is not always the case that more 'competition' is better. Brand proliferation may generate welfare losses through excessive expenditures on fixed costs associated with each brand. At least some competitive advertising may be wasteful, as firms duplicate each other's expenditures in order to avoid market-share losses. Competition in physical investment or R&D duplicates capacity or innovation expenditures. The sunk costs involved in building a strong market position may become a barrier to entry, even if the intention was innocent competition rather than to exclude entrants.

Alternatively, competition may be valuable as a means, not just an end, with the competitive process arising out of disequilibrium giving opportunities for entrepreneurs to exploit superior information and earn profits (Littlechild). Equilibrium is never achieved because the market is always changing due to new firms and products, innovation, new information, and shocks.

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3.3 Collusive Strategies

3.3.1 Traditional Models

Collusion may be tacit or explicit, whether or not there is explicit communication is irrelevant, what matters is whether a collusive agreement, however arrived at, can be sustained by the self-interest of the parties involved.

> *"Businessmen's meetings, even for merriment and diversion, usually end up in connivance to restrict competition. It is impossible indeed to prevent such meetings, by any law which either could be executed, or would be consistent with liberty and justic"e – Adam Smith*

Equilibrium concepts present oligopoly theory as a collection of models based on a ad-hoc set of assumptions about firm's perceptions of their rivals' reactions to their own choices of prices or outputs. These can be thought of as one-shot non-cooperative games in which the Nash equilibrium concept can be applied to find a solution. They differ not in respect of reaction patterns but in the economic characteristics of the market concerned, and it is a matter of fact, not logic, to decide which model is appropriate for a given market under study.

The Cournot model: firms independently choose outputs on the assumption that rivals make no response to their choices and market equilibrium is achieved through a sequence of alternating output choices which converge over time. Price and profits settle between PC and monopoly levels.

The Stackelberg model: a leader makes a choice of output, the other firms act as followers and make their profit-maximizing response to this output. The leader takes account of these responses in choosing its output and is able to do better than it would under Cournot reactions – there is a first mover advantage.

The Bertrand model: firms independently choose prices, assuming rivals make no response to their choices, and assuming no capacity constraints.. When firms produce identical outputs and have identical marginal costs equilibrium price ends up equal to this common cost. If MCs are constant and differ between firms then only the firm with the lowest MC is left in the market and it sets a price just below the marginal cost of the next-to-lowest cost firms. This seems to be the perfectly competitive market outcome with P=MC and no excess capacity! But this is a special case. If MCs are not constant then no equilibrium price exists unless outputs are non-homogenous i.e. product differentiation.

The kinked-demand curve model: each firm believes that price reductions will be matched by rivals, but price increases will not, creating a kink at the firm's perceived demand curve at the current price and output, which then tends to remain the same despite changes in marginal cost, because of a discontinuity in the firm's marginal revenue. However, how the original price and output is arrived at is not explained.

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The Edgeworth model: firms choose prices as in the Bertrand model but with fixed output capacity. A range of outcomes including Cournot and Bertrand outcomes are possible, but also the possibility of price cycles – oscillations between lower and upper limits determined by demand, cost, and capacity parameters.

3.3.2 Game Theory Models

Payoff [A,B]		**Firm B's output**	
		High	Low
Firm A's output	High	1, 1	3, 0
	Low	0, 3	2, 2

The dominant strategy is for each firm to choose a high output: this is best regardless of what the other firm does. The non-cooperative outcome is a payoff of [1,1]. The problem of collusion is for firms to simultaneously choose low outputs and achieve the superior payoff [2,2], in spite of 'high' being the dominant strategy.

Effective collusion does not depend on explicit agreements; antitrust policy may not be useful against tacit non-cooperative collusion. Nevertheless, collusion might be facilitated by certain practices. Perfect equilibrium (Selten) requires strategies chosen by the players, as a whole and in each subgame (each choice made), be a Nash equilibrium.

Whether non-cooperative collusion is possible in a repeated game depends on:

1. Whether game is repeated indefinitely or a finite number of times
2. Extent of information about objectives and opportunities available to rivals
3. Whether players know prior moves of rivals i.e. cheating can be detected
4. How much weight players attach to the future

Even with finite rounds, and 'high' becoming the dominant strategy at the last round, A may play a trigger strategy / tit-for-tat in prior rounds, i.e. choosing 'low' and cooperating until B defects, sustaining a self-reinforcing Nash equilibrium of non-cooperative collusion.

The tacitly collusive equilibrium requires information that cost and demand conditions are similar. Firms must choose prices and outputs sustainable by a credible punishment strategy which is also tacitly agreed on. There may be many punishment strategies and a large set of sustainable price-output configurations for each of them. These information requirements expand considerably with the number of firms, product heterogeneity, uncertainty, rate of technological change, and extent of threats from entry. None of these theories examine how firms will converge on one of the many possible equilibrium agreements.

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3.3.3 Enforcing Collusion

Future losses from punishment have to be set against current gains to defection, i.e. the rate at which a firm discounts the future will be important. The more heavily firms discount the future the less likely collusion can be sustained. Gains from defection depend on cost, demand, capacity, and the length of time for which higher profits can be earned before retaliation. Hence given significant excess capacity, and P>>MC, a significant output expansion will be both feasible and attractive. The longer the other firms take to detect and punish the defection the greater the gain for the defector. Three main types of punishment strategy:

1. **Nash reversion**, i.e. returning to the NE of the one-shot game to wipe out gains of defection. However this may imply only a moderate loss of profit for the defector compared to collusion. Where MCs are unequal, some firms may earn higher profits in a NE
2. **Minimax punishment**: forcing the defector to the minimum profit-maximising profit given the actions of other firms (i.e. it's security level). This threat can always enforce a collusive agreement which gives profits exceeding security level for some interest rates. Defectors must weigh up one-off defection gains versus the present value of the infinite future stream of profit it loses.
3. **Simple penal codes** (Abreu): a period of price warfare, enough to wipe out the gain from reneging and a reversion to collusion. This corresponds to empirical observations of occasional price wars

For a punishment threat to be **credible**, it must be in the firm's best interest to carry out the threat when a called upon to do so. Minimax punihment may not be subgame perfect because the minimax choice is not a Nash equilibrium.

The assumption of perfect information may be unjustified; firms may not be able to observe each other's output levels and defection. If a firm's choice of output cannot be observed by rivals, and sum of outputs determine market price which is subject also to unobservable demand shocks, then firms do not low if prices are low because of cheating or low demand. Randomness in demand may provide scope for cheating (Stigler). Green and Porter suggest that one equilibrium strategy might be collusion as long as price remains above Pcritical, switching to aggressive non-cooperative behaviour when P falls below Pcritical, before restoring collusion a given number of periods after the price drop. The threat of non-cooperation deters defection, but there is occasionally an episode of non-cooperation when demand is especially low. Hence falls in prices may not be collapses in cartel discipline, rather, they enforce cartel discipline – firms punish to enforce the agreement.

Bounded rationality implies that firms do not have unbounded capacity for working out strategies and payoffs. The tit-for-tat strategy is very effective and far chosen even though it is far simpler than others (and not subgame perfect or renegotiation-proof). A firm's reputation may also be a disciplining device.

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3.3.4 Facilitating Collusion

1. **Information exchange**, with or without a formal information exchange agreement

2. **Trade associations** may also collect and disseminate information, suggest price lists (e.g. doctors). The trade association in the UK nut and bolt industry actually employed individuals who posed as buyers to obtain discounts on prices from sllers suspected of cheating. Trade associations may also forecast demand and plan capacity to prevent development of excess capacity.

3. **Price leadership** – dominant or barometric. This is one way of solving the problem of choosing one price agreement in the set of possible agreements.

4. **Collaborative** research and cross-licensing of patents to reduce fixed costs, gain economies of scale, and share risks. Cross-licenced patents legally allow for specification of selling prices and sale restrictions e.g. geographical.

5. Salop: **Most-favoured nation clauses** (will not supply another buyer at a lower price), and meeting-competition clauses (will meet cheaper suppliers' prices) facilitate non-cooperative collusion by making it easier for firms to monitor rival behaviour (the buyer has the incentive to detect and report deviations from the price agreement), and reduce price-reduction incentives. MFN clauses makes it costly for sellers to reduce price in a discriminatory way. MC reports cheating sellers and nullifies the effect of cheating.

6. **Resale price maintenance**: controlling minimum prices charged by retailers, stopping collusion at the manufacturing stage being undone by price competition at the point of sale

7. **Basing point pricing**: common in high transport cost industries e.g. cement – all sellers quote uniform prices equal to the base price at the nearest base (manufacturing plant) plus the standard transport charge to the location of the buyer. The list of bases, base prices, and standard transport charge are information that needs to be exchanged by firms.

8. **Public costing books** – showing how prices are calculated based on variations in specifications (e.g. engines etc).

9. Insurance companies **collaborating** in working out loss probabilities, leading to premium uniformity.

10. **Switching costs**, natural or created e.g. loyalty programmes, promote collusion.

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3.3.5 Evaluation

From a policy perspective, the core of the problem is that tacit collusion is a form of non-cooperatie equilibrium, resulting from rational self-interest and mutual interdependence. UK legislation is effect-based, appraising outcomes from the point of view of economic efficiency, while US legislation requires proof of illegalities.

Collusion can be beneficial - Richardson: **lumpy demand** in some markets made it essential that contracts be shared out, to ensure that competitors were not exposed to the risk of alternating feast or famine in their order books. Same case for lumpy investments – e.g. agreements to take turns in investing to avoid excess capacity. Recession cartels to prevent the scrapping of capacity that will remain viable in the long-term, or to ensure industry contraction in an efficient manner. Sectors with monopsonists may organize to increase bargaining power. Export cartels and import cartels improve terms of trade and can generate welfare gains.

Case study: Before 1991, elite American universities agreed among themselves not to compete for the best students through merit-based scholarships in order to channel their money to truly needy students. But the US Justice Department charged them with violating anti-trust legislation, prompting them to end such cooperation. What ensued was a free for all as universities tried to match each other's scholarship offers to attract the highest-scoring students, which drained funds available for financial aid

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3.4 Innovation Strategies

3.4.1 Market Failures In R&D

Schumpeter elucidates how the process of technological changes involves three stages and different types of R&D.

1. **Invention**, involving basic research to acquire new knowledge and applied research directed towards practical objectives
2. **Innovation**, involving applied research to transform ideas into new products
3. **Diffusion**, the spread of use and ownership of new technology. While costs are front-laden, it is only at the diffusion stage that the economy obtains benefit from technology

The visible hand may be quite good at achieving static efficiency, but dynamic efficiency is quite another matter, due to several market failures in play:

Appropriability problems: Information is unlike ordinary commodities (Arrow, Dasgupta). Once discovered, a piece of information can be made widely available at very little social cost. This is an extreme kind of scale economy as MC approaches zero. Knowledge is indivisible, and once a certain piece of knowledge has been acquired there is no value to acquiring it again (Marx). It is almost a public good.

From the firm's perspective, R&D represents risk and expenditure, however if a firm does not engage in R&D while others do, it may lose its competitive edge and incur large losses. The cooperative strategy is that all firms do not engage in R&D. However, the dominant strategy is for all firms to go ahead with R&D spending.

Payoff [A,B]		**Firm B's R&D**	
		High	Low
Firm A's R&D	High	2, 2	3, 0
	Low	0, 3	1, 1

There is hence a conflict between static and dynamic efficiency. From the social point of view it is beneficial for information to be widely disseminated, as it allows more intensive competition. But this meets an appropriability problem: the more other firms free-ride on the R&D efforts of the first firm, the less incentive there is to engage in R&D in the first place. While the innovator requires rewards, static efficiency requires free access to his results, so the free market allocates resources inefficiently to R&D.

> *The paradox of patents: By slowing down diffusion of technical progress, ensures that there will be more progress to diffuse. (Robinson)*
>
> *The incentive for innovation requires inefficient diffusion of knowledge (Spence).*

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In the case of a monopoly, appropriability is perfect, but the lack of rivalry may not provide incentives for innovation on the part of the monopolist (later). Freedman found that research activity declines once firms exceed a certain size relative to the market. However, innovation is spurred not only on the part of the monopolist, but also potential entrants eying monopoly profits, as Schumpeterian creative destruction elucidates. (3.6).

> *A more competitive market may lead to less rapid innovation; the benefit in lower current prices may not compensate for future lower prices (Nelson & Winter).*

Externalities: Even with perfect appropriability, the private reward is less than social reward, since successful R&D benefits consumers over and above the gain in profits to the innovator through positive externalities

R&D duplication: On the other hand, the first-mover advantage successful R&D confers (or even a first-mover-takes-all nature) due to patents, preemption of resources, and reputation can induce excessive speed in the process. Firms may duplicate each other's R&D efforts, leading to economic waste.

However, rivalry may be desirable, if independent (not completely parallel) research strategies are pursued (as is usually the case). Gradual improvements on existing products can be made – most R&D is incremental rather than groundbreaking. Competition between researches allows incentive for effort, which is difficult to provide otherwise as research inputs and outputs being hard to measure, and the relation between them uncertain.

Imperfect information: R&D takes place in an environment of incomplete information and uncertainty. Given asymmetric information (managers having more information about R&D than investors), managers anxious to satisfy stock-market opinion may divert resources towards visible signals of corporate health (e.g. high dividends) and away from less tangible activities (R&D). Risk aversion may become a dominant influence in R&D investment decisions, if there is excessive short-termism in financial markets. Hence the nature of financial institutions, and how well monitoring arrangements are, can influence how well such problems are outcome.

Allocative inefficiency: As a considerable markup is needed to recoup R&D expenditure and compensate for high risk, coupled with the fact that once the knowledge is gained, the marginal cost of using it is 0, price generally exceeds MC even in reasonably considerable R&D intensive industries. It becomes difficult to identify what might be an excessive price especially in R&D intensive sectors.

Strategic trade policy: Goverments may also seek to influence the position of their national firms in world markets. Countries may have unilateral incentives to subsidize the technological efforts of domestic firms e.g. Boeing vs Airbus.

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3.4.2 R&D Policy

Patents promote incentives for R&D by somewhat solving the appropriability problem. However, they do not guarantee appropriability, since other firms may learn and innovate around the patent. It is said that firms sometimes refrain from patenting because of the loss of secrecy it entails. (Hausman). Again, there is a tradeoff between static and dynamic efficiency: Patents also generate enforcement cost, as well as social costs of allocative and/or productive inefficiency if it generates market power. Competition for the reward may encourage duplication. On balance, they are perhaps necessary: Mahsfield found that 65% of pharmaceutical innovations would not have occured without patent protection. Patent length juggles the twin goals of static and dynamic efficiency.

Public provision can overcome the free-rider problem while avoiding competitive duplication. This can be a Smithsonian contrivance, i.e. tax-funded, or some variant of a Lindahl market mechanism to supply this 'public good'. However, this is a command mode of planning, with its attendant problems. Also, there may be a free-rider problem within countries, where one government's research output is utilized freely by another country (but the concentration of private benefit on the local government in question mitigates this to some extent).

Arrow argues that the more basic the character of the research the more in need it is of public funding, because more basic research is less appropriable, and more risky with longer gestational lag such that it is likely to be undervalued by risk-adverse private firms. However, Rosenberg argues that the most successful basic research labs have been in firms with strong market positions, ensuring they can absorb risk and take the long view.

Defence industry spending can also be seen as a form of private provision of information due to spill-overs, assuming the technology gained is made generally available, which may not be the case. This may also crowd out the private sector.

Risk-sharing in many forms is a weaker form of governmental provision and can help where the government is less risk-averse than private sector. This has been used in aerospace industries. However, it is bound to involve failures and losses, and can be subject to adverse selection and moral hazard.

Subsidies: a combination of R&D subsidies to encourage innovation and high spillovers allowing competitive and widespread efficiencies can improve the tradeoff between static and dynamic efficiency, promoting both efficiencies (Spence). Subsidies are also used as trade policy.

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However, the appropriate rate and direction of subsidy is unknown: the costs and benefits of R&D are hard enough to measure ex-post, let alone ex-ante. Targeting industries for subsidy is problematic, since the public authorities who give subsidies have less information about the costs and benefits than those who seek them. There is a cost of marginal distortion elsewhere in the economy arising form the extra taxation needed to pay for subsidies. Also, given restricted scientist supplies, R&D subsidies may just drive up their salaries rather than lead to greater R&D, depending on the elasticity of substitution between labour and other R&D inputs.

Encouraging cooperative R&D can internalizes externalities between firms and in principle overcome both free-rider and duplication problems. In the strongest form, mergers in high-tech industries may permit scale economies and R&D pooling.

However, the obvious danger is that R&D collaboration can lead to anticompetitive collusion. Also, research joint ventures diminish innovation incentives – if all firms succeed in achieving common cost reductions, they would not enhance their profits much by introducing the same because prices will fall in line with costs, and consumers will be the main beneficiaries. However this is not true if only a subset of firms in the industry are involved.

Diffusion policies (e.g. in fibre optic technology) can speed up the adoption of new technologies by reducing acquisition costs, such that the diffusion path becomes welfare-optimal, taking into account positive externalities instead of profit-maximising.

Standards and compatibility: standardization minimizes consumer switching costs, increasing competition, and allows full exploitation of scale economies and network externalities (e.g. standard USB ports), minimizing duplicative research efforts (Blu-ray DVD vs HD-DVD).

However coordination on a suboptimal standard (e.g. QWERTY keyboard) has obvious costs and may be irreversible. The requirement of a given standard can stifle new and better standard innovation. Governments and firms can influence standards when the technology is at its infancy, but this is when all parties are least informed.

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3.5 Contestability vs Entry Limiting

3.5.1 Contestable Market Theory

Contestable markets theory (Baumol, Panzer, Willig) held that where entry and exit costs are negligible (access to same technology, no sunk cost), and where incumbents do not respond to entrants by immediately reducing price, the very threat of market entry incentivises firms with market power to deter competition by charging no more than a potential entrant could (**limit pricing**), for if they charged any higher, entrants could enter and engage in hit-and-run competitino, stealing market share.

> *Even a very transient profit opportunity need not be neglected by a potential entrant, for he can go in, and before prices change, collect his gains and the ndepart without cost. Baumol*
>
> *"Pressure of potential competition compels even a natural monopolist to produce efficiently and earn no more than normal returns to capital" (Baumol)*

This gives a best of both worlds scenario, where society gets both the price and output as if under perfect competition, with the monopolist earning only normal profits (or new firms will enter) and producing efficiently (or new firms can undercut), as well as the innovation, economies of scale, and minimal duplication of a monopolist.

The textbook example of a contestable market would be the airline industry, and empirically, potential competition being unleashed since legal barriers to entry have been removed has resulted in the slashing of air fares and the bankruptcy of major but inefficient airlines.

Problems: On the other hand, the twin assumptions of contestability rarely hold. Entry and exit costs are rarely negligible and often high. The airline industry may have lower exit costs, since the capital input (planes) is geographically mobile and can be switched to serve other markets should entry into a certain market prove unprofitable. Yet there are administrative and legal hurdles (transaction costs) often incurred, and empirical studies have shown that even minor exit costs greatly reduce the degree of contestability, and are correlated with higher monopoly profits. This is even more so for industries with high sunk costs (e.g. manufacturing, where machines to produce shoes can produce only shoes), or natural monopolies where a duplicative network of water pipes are unlikely to be built by any entrant. Hence this first assumption rarely holds.

The second assumption that incumbents will not reduce prices in response to entrants has also been empirically proven wrong. Contestability seems to self-contradict by arguing that incumbents cut prices in response to potential competition (in contestable markets), but not when the actual competition appears at the incumbent's doorsteps. Incumbents do cut prices and employ asymmetric advantages e.g. greater capacity to bear losses given accumulated profits and economies of scale, to undercut the competition or in fact engage in predatory pricing or other strategic behaviour (3.5.2).

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Contestability has been criticized as a non-robust theory; there is no grounds to believe that the threat of entry compels benign behaviour from natural monopolists and hence regulation is unnecessary.

Implications: Yet, contestability underlines the importance of measures to reduce barriers to entry and exit where possible. Also, in light of contestability, any intervention may be better directed at lowering entry/exit costs (e.g. awarding bus routes on competitive tender) so as to make even natural monopolies contestable, rather than classic regulation e.g. price-cap regulation which is prone to regulatory capture.

3.5.2 Entry-Limiting (Strategic) Behaviour

Different types of barriers to entry exist:

- Structural barriers: exist without any plan on the part of the incumbents e.g. due to government intervention, technology, consumer preferences etc
- Innocent barriers: cultural differences, geographical isolation, government regulations, insufficient market size, unprofitable entry, limit pricing
- Strategic barriers: endogenous to the industry, imposed by incumbents

Entry-limiting behaviour is mainly concerned with increasing strategic barriers. This is usually frowned upon, however, it is difficult to distinguish innocent behaviour from strategic behaviour. A firm that innocently lower costs and improves products may simultaneously be making entry harder.

> *The average entrant is basically a tourist and not an immigrant, enjoying a life that is often nasty, brutish and above all short (Geroski)*

For successful (noncooperative) entey deterrence a firm must have:

1. Ability to set monopoly price when not threatened (i.e. not be a perfectly contestable market)
2. Asymmetric Advantage over a potential entrant (incumbent, first-mover, excess capacity, lower costs). The incumbent's advantage arises from his strategic position: his monopoly persists if he denies entry, while entrants can at best hope for competition in event of entry.
3. Credible Commitment changing expectations about post-entry competition. This may require inflexibility or be difficult to reverse, such that rivals believe the threat.

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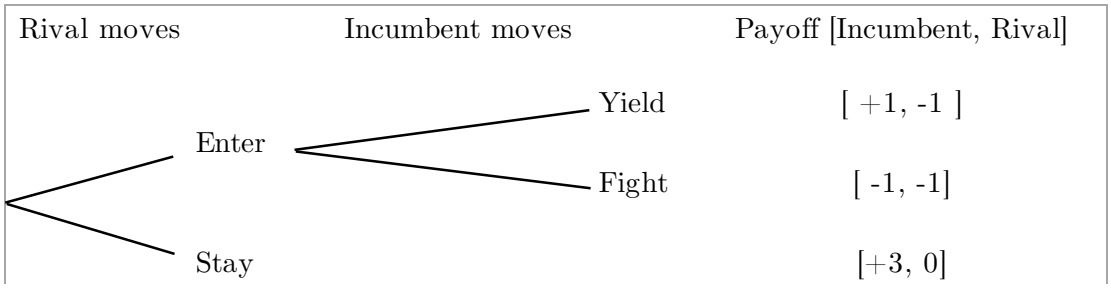
3.5.3 Predatory Pricing And Excess Capacity

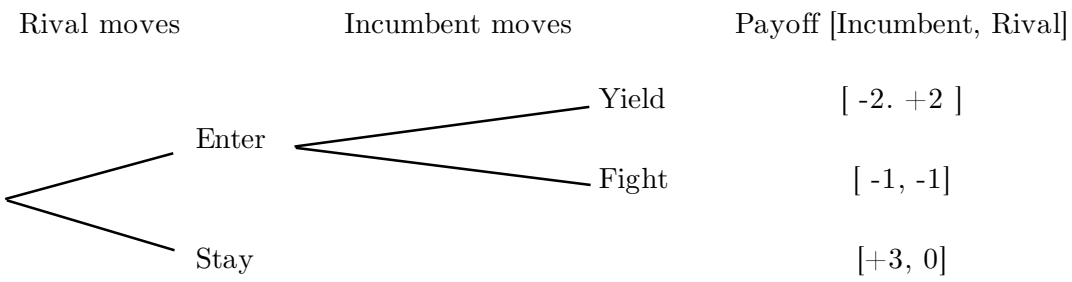
In predatory pricing, a dominant firm prices aggressively in markets with actual competition, in view of eliminating the competition. The price-cutting undercuts the competitor's profits (a war of attrition, with the predator better financed), and builds a reputation for efficiency since the competitor has imperfect information about the predator's costs.

Problems: Once entry occurs, a new game begins independent of previous behaviour (Friedman), hence incumbent's pre-entry output makes no difference to profitability of entry. There are two Nash equilibria, in which each player gets the maximum payoff given the strategy chosen: Entrant enters and incumbent yields in event of entry, or entrant stays out and incumbent fights in event of entry. So if entry occurs, the incumbent would find yielding more profitable (+1 for yielding vs -1 for fighting). Hence the incumbent's threat to fight is not credible, and the entrant would choose to enter.



Uncertainty about behavior is needed to get firms to succumb to predatory pricing. Although, a reputation for toughness may succeed against small firms without deep pockets. A reputation of being a low-cost firm (or the illusion of a low-cost firm) may also lend credibility to an incumbent firm to make predatory pricing successful.

Excess capacity: The incumbent can choose to make his threat credible by committing himself irreversibly (i.e. a sunk cost) to a course of conduct that would be detrimental to entrants. For instance, firms may invest in excess capacity, promising that existing firms can produce enough output to meet the extra demand resulting from lower prices, strongly signaling that established firms are able to reduce prices in response to entry. Now, if entry occurs, the incumbent's dominant strategy is to fight (-1) rather than yield (-2), so the entry deterrence is credible.



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3.5.4 Other Entry-Limiting Behaviour

Raising rival costs: setting high industry wage rates increases costs for both firms, but deters entry and may be beneficial for incumbents. For a good with large network externalities, specifications may be played with e.g. refusing to release specifications needed to connect to an existing network. Advertising raises entrants' sunk costs of entry, and firms may invest in goodwill advertising to ensure consumers do not switch (Fudenberg's Fat Cat)

Raise switching costs: This can be done through e.g. loyalty discounts, not allowing phone number portability, etc.

Denying access to competitive technology e.g.pre-emptive patenting to deny patents to rivals. Here, the incumbent's initiative to win the patent exceeds the rival's, even if the patent is for a technology inferior to existing technology.

Brand proliferation: fill up product space in a way to deny entrants remaining slots or niches, may also giving buyers uncertainty about the quality of new brands. Suppose all brands of shampoo are equivalent. If initially there are 3 shampoo brands, each having 33% of the market. A new entrant, ceteris paribus, may take 25% of the market. However, if there are 9 shampoo brands, then the new entrant may take only 10% of the market.

Commodity bundling: by offering a bundle of goods at a lower price than the sum of the prices for the components of the bundle, the supplier is able to prevent competition from producers of individual goods within the bundle. Situation is more acute if IP rights or product design by a dominant firm excludes rivals from supplying products that are compatible with its equipment.

Vertical integration or exclusive contracts: This takes the form of xeclusive distribution, exclusive purchasing, tie-ins, full-line forcing, refusal to supply etc. The fear is that the incumbent may favour their associated business over that of competitors, whether in quality of services or prices charged. The consensus is that this is that vertical integration is a problem only if competition is absent in either the upstream or downstream market, otherwise, having vertical structures of firms and distributors which compete in markets may simply result in efficiency gains e.g. overcoming incentive problems (section 3.1)

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3.6 The Implications Of Market Power

Perfect competition is somewhat an ideal case from both efficiency and equity points of view. In perfectly competitive markets, firms earn normal profit and workers earn transfer earnings. All surpluses, supernormal profit, and economic rent is redistributed to consumers. While Galbraith takes a cynical view and argues that the focus on competition is an anachronism of bygone days when economics was developing and the world could be reasonable characterized as competitive, the debate between monopoly and perfect competition may not be relevant today.

> *"No such thing as pure competition. Every producer has an effect, however tiny, on the price." (Friedman)*
>
> *"I have become increasingly impressed with how wide is the range of problems and industries for which it is appropriate to treat the economy as if it were competitive" (Friedman)*

One one hand, free competition may be wasteful e.g. advertising, loss of scale economies. There is a theoretical possibility of **excessive entry** (Mankiw): if firms incur fixed costs, the free-entry zero-profit equilibrium may result in too many firms operating with high average costs. Hence entry deterrence may be socially optimal, higher prices being offset by lower average costs. Competition policy should not aim to break up natural monopolies, but may isolate it from upstream and downstream businesses. On the other hand, monopolists may engage in **directly unproductive rent seeking** (Bhagwati) e.g. lobbying for protection, incurring unnecessary costs of keeping up strategic barriers to entry which are bourne by society.

Also, while perfect competition enjoys static efficiency, it may not be dynamically efficient. Firms in perfect competition have little incentive to innovate, for they can earn only normal profits. Furthermore, the uncertainty of R&D results in higher rates of return being demanded. Schumpeter's theory of creative destruction posits how monopoly creates an incentive structure that rewards R&D investment to estabilish barriers to entry. Market share is found to be correlated to innovation, and empirically, it seems that many product innovation come from big firms. Monopoly profits may not be a big problem in the long-run if it provides the stimulus to the very ingenuity required to break down monopolies and create technological advancement. This trade-off between static and dynamic efficiency is a problem for competition policy.

> *"The successful competitor, having been urged to compete, must not be turned upon when he wins" (Judge Learned Hand, USA)*
>
> *"While perfect competition ensures that all firms make efficient use of the pie, the bigger the pie, the less a few stolen crumbs matter" (The Economist)*

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Regulatory frameworks have to beware of government failure, which may be more damaging than monopoly. After all, the main virtue of a market economy is that firms can pursue their objectives without constant scrutiny. In particular, it is hard to define the base for price-cap regulation, and prevent regulatory capture. Where competition is international, international harmonization of competition policy is essential. Second-best problems should also be taken into account, i.e. the existence of price distortions in related markets may require a price distortion in the market under consideration.

Apart from imposing actual competition, alternatives can be increasing contestability, competition in the market for corporate control, or competitive tendering / franchise competition involving bidding for licenses to operate. However, the non-robustness of contestability theory may be worrying for such efforts.

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4 Trade & Globalization

Syllabus objectives

- Examine comparative advantage: increasing costs, partial specialisation and dynamic CA
- Examine and evaluate: Factor endowment theory (Heckscher-Ohlin), Factor price equalization, Intra-Industry vs inter-industry trade
- Examine and evaluate the economic and welfare effects of exchange rate and strategic trade policies, economic sanctions, protectionism, trade barriers and WTO, free trade agreements and regional trading arrangements such as free trade area, customs union, common market, economic union and monetary union and their implications
- Examine the vertical, horizontal and conglomerate integration in relation to MNEs, motives for FDI, evaluate MNEs as a source of conflict in relation to employment, technology transfer, national sovereignty, balance of payments, taxation, transfer pricing, outsourcing
- Examine and evaluate the economic effects, benefits and costs of globalisation on economies at various stages of development with a focus on emerging economies; in particular, impact on competitiveness, outsourcing, employment, labour mobility, capital flows, exchange rates, balance of payments, economic growth and development, and their implications on national policies

4.1 Trade Theories

4.1.1 Mercantilism

> *"The ordinary means therefore to incease our wealth and treasure is by foreign trade, wherein we must ever observe this rule; to sell more to strangers yearly than we consume theirs in value" – Thomas Mun, 1664*

Mercantilism viewed trade as a zero-sum game. Countries attempted to acquire precious metals, while prohibiting export. Exports were subsidized and imports of consumption goods (not raw materials) were taxed. Trade monopolies (e.g. the East India Company) fostered higher profits using both monopoly and monopsony power. We now know mercantilism's flaws. Accumulating trade surpluses would lead to inflation, reducing export competitiveness and removing the surplus. Even so, mercantilism is not dead today. Non-US ships are still prevented by law from carrying goods between US ports.

> *"If we just stopped trading with the rest of the world, we'd be $100 billion ahead" – Ross Perot, presidential candidate*

4.1.2 Absolute Advantage

In contrast with mercantilism, Adam Smith's absolute advantage theory viewed trade as a positive-sum game. Countries should specialize in and export the goods in which they had an absolute advantage and import the commodities in which the trading partner had an absolute advantage.

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4.1.3 Comparative Advantage

Ricardo's theory of comparative advantage further extends Smith's theory, showing that differences in opportunity cost (and not just absolute cost) gives countries an incentive to trade to increase national income. While production is constrained by the PPC, countries may consume outside the PPC as economies are exposed to a new set of relative prices. Countries gain because of a consumption gain (due to exposure to new lower prices) and production gain (due to specialization). While not everyone may gain, the potential gains from trade are great enough such that those who gain can compensate the losers and still be better off (but this may not happen in reality)

The terms of trade determine the distribution of gains between the two countries: the close the terms of trade are to a country's autarky price ratio, the smaller the gain for that country from international trade. Mill illustrates how the equilibrium terms of trade reflects the size and elasticity of demand for each other's products, given initial production conditions determined by resource endowment and technology.

If trade is not balanced between the two trading partners; the equilibrium terms of trade are realized by adjustments in relative wage rates, i.e. the price-specie-flow mechanism: A country with a trade surplus will find gold flowing in, resulting in an increase in prices and wages, continuing until wages have risen sufficiently to reduce its exports and increase its imports and trade is balanced.

Empirical verification: MacDougall (1951) shows export performance is consistent with relative labour productivities and wage rates. Golub (1990): since Japanese labour productivity is 60% lower than US productivity in, 20% above in automobiles and 70% above in steel, it makes sense that the US had trade surplus with Japan in food but deficits in automobiles and steel. Today, it is not just about producing goods, but about stages of production: capital or technology intensive stages of production takes place within developed countries while labour-intensive assembly operations take place in developing countries, reflecting comparative advantage differences.

Problems: However, this theory did not explain the origins of comparative advantage. Its assumptions are strict:

- That factors of production are completely mobile internally is not true, since the movement from the autarky production point to the trade production point may first involve movement inside the PPC as workers and equipment no longer used in import-competing industry take time to be fully reabsorbed in export industry.
- That factors of production are completely immobile externally is also not true, since labour and capital flows are alternative to goods flows.
- Zero transportation costs does not hold, and in fact, high transportation costs may mean that some goods are non-traded. The textbook example here is a haircut.
- Technology levels are not fixed, giving rise to dynamic comparative advantage.
- Constant returns to scale does not hold, so trade can exist due to scale economies.

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4.1.4 Heckscher-Ohlin Theorem

The Heckscher-Ohlin theorem explain the origins of comparative advantage, addressing this gap: countries will export products that intensive in their abundant factors of production, and import products intensive their scarce factors of production. For instance, China's abundant labour enables it to export labour-intensive goods, while the USA exports technology-intensive goods.

However, H-O again does not take into account technological changes. It seems to be refuted by the **Leontief Paradox.** Leontief (1954) found that the US exported more labour intensive products even though it was abundant in capital.

However, it may simply be a nuance here: US exports are skilled labour-intensive, while imports are unskilled-labour intensive. Perhaps the US is skilled labour and capital abundant, but unskilled labour scarce, and hence this trade pattern corresponds to the H-O prediction. Also, US imports may not be capital-intensive, but merely natural resource intensive (e.g. oil), so if US is scarce in natural resource, there is no conflict with H-O.

Alternatively, we may also explain the Leontief paradox if we hypothesize that the US has a relative preference for capital-intensive goods, bidding up the price of capital until the US comparative advantage lies in labour-intensive goods. This is a case of demand reversal, resulting in trade flows in the opposite direction as predicted. However, if demand for labour-intensive goods is low, wages seem to be implied to be low – and this is not right. Furthermore, if the price definition of relative factor abundance (rent/ interest vs wage) instead of the physical definition (physical units of 2 factors) is used, such that the more expensive US labour now becomes the 'scarce' factor H-O still holds even in this situation.

Finally, it may also be that this apparent paradox is due to tariff distortions: since US labour is more protectionist than US capital, US tariffs hit harder on labour-intensive imports, such that the US import bundle becomes more capital intensive.

4.1.5 Stolper-Samuelson Theorem

The Stolper-Samuelson theorem is one conclusion deriving from the H-O theorem: an increase in the relative price of a good (e.g. due to greater demand due to trade) will lead to an increase in the return of the factor used intensively in the production of that good, and a fall in the other factor. For instance, should a capital-abundant country initiate trade, greater demand for capital-intensive goods due to the larger market increases the price of these goods, so returns on capital rise, while returns to labour fall. In general, trade benefits the abundant factor, hurting the scarce factor. Hence, under traditional H-O, the abundant factor prefers free trade to autarky, while the converse holds for scarce factor.

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This result logically leads to the suspicion that the large growth in trade since WW2 might have been the cause of the accompanying large rise in inequality in developed (i.e. capital-rich countries), since with trade, returns to labour fall. However, this encounters several issues: if it were true, then the prices of low skill-intensive goods should be falling, since factor prices move in the same directions as the prices of the goods they produce. Empirically, however, there has been no pronounced decline in the prices of unskilled labour-intensive goods relative to skilled labour-intensive goods. Hence the rise in inequality may be due to other reasons, e.g. technological change, outsourcing, or migration.

> *Marx may indeed be striking again, but not with the assistance of Samuelson. The task before us then is to make this amply clear before the fear of trade with the 'Asiatic ants' and the 'reserve army' of cheap labour in the poor countries gets out of hand. (Bhagwati)*

As with the H-O theorem, scale economies can invalidate the SS theorem, causing both factor's real wages to rise, if the redistributive effect which presses down the wages of unskilled labour is outweighed by the lifting-all-boats effect of scale economies on the marginal products and hence real wages of both factors. This seems to explain the seemingly contradictory rise in inequality (due to rise in wages of the top earners), coupled with the stable prices of low skill-intensive goods.

Also, Bhagwati points out how SS holds only under conditions of incomplete specialization. Once specialization is achieved, any further rise in the good's price benefits both factors. However, to achieve specialization, the SS effects are first experienced.

4.1.6 Factor Price Equalization

This is another conclusion deriving from the H-O theorem. Suppose trade is initiated between a capital-abundant country and a labour-abundant country. Initially, capital is more expensive in the labour-abundant country than the capital-abundant country. With trade, the capital-abundant country exports capital-intensive goods, so the demand for and price of capital increases while that of labour falls. The converse happens in the labour-intensive country, so the more expensive capital in the labour-abundant country becomes cheaper, while the cheaper capital in the capital-abundant country becomes more expensive and equalizes, and similarly for labour.

However, in reality, factor price equalization is rarely complete, since H-O's assumptions are never fully realized. Transportation costs, nontraded goods, tariffs, subsidies, variations in the quality of factors, unidentical technology (different rewards given factors of production), and market imperfections contribute to different product prices between countries. Prices do not equalize, but tend to equalize, assuming the presence of unemployed resources does not entirely absorb the upward price pressure on the abundant factor.

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4.1.7 New Trade Theories (Scale Economies)

The collection of models under New Trade Theory explain how gains from trade can come from cost reductions due to specialization that exploit economies of scale, even with identical autarky positions. According to Krugman, trade often takes place as a result of more or less arbitrary specialization based on increasing returns, rather than an effort to take advantage of exogenous differences in resources or productivity. Examples include the establishment of silicon valley, and Boeing in seattle. Once established, production generates a dynamic of its own and tends to be self-sustaining.

The **Lindler model** (**country similarity theory**) posits that trade in manufactured goods will be more intense between countries with similar per capita income levels than dissimilar per capita income levels. The tastes of representative consumers in a country yield product demands, and in tern generating a production response and trade occurs in goods that have overlapping demand. The direction of trade is not specified, indeed, with product differentiation, the same class of good may be sent in both directions – previous models did not allow for this, for a country could not have both a comparative advantage and disadvantage in the same good.

Empirically, this has been proven to be right. **Intra-industry trade** i.e. trade for the same type of good, with each firm/country selling a different product, which cannot be on comparative advantage, consisted on 60% of European trade and 57% of American trade.

But there is a complicating factor - countries with similar per capita incomes tend to be geographically close, so intense trade may also reflect low transport costs and cultural similarity. It might also be a simple case where higher quality varieties of the good are exported by capital abundant countries and lower quality varieties exported by labour-abundant countries, assuming higher quality variety requires more capital-intensive technology, which fits the Heckscher-Ohlin model.

Krugman's Gravity Model suggests that trade flows between 2 countries is proportional to the size of their GDPs and inversely proportional to the distance between them, large countries spending more on imports and attracting larger shares of other countries' spending because they produce a wider range of products

Implications: As a result of scale economies, the increased well being from trade can made available to all consumers, even if a person is a "scarce factor" in a H-O context and would tend to lose from trade. The gains from both higher real wages due to scale economies and from lower-cost and greater variety of differentiated goods can more than offset the loss from being a scarce factor.

There are a number of uncertainties in these models – there is no way to know which country will specialize in which good, and it is not clear what shock jolts production away from the autarky production. The choice of specialization may be based on an "accident of history" (Krugman), leading to first-mover advantage, illustrating a clear role for strategic trade policy, even if trade patterns reflect CA at a broad level (e.g. capital-intensive etc)

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4.1.8 Reciprocal Dumping Model

This illustrates how trade can arise as a result of the behaviour of national monopolies. Suppose there are 2 countries, with 1 monopolist in each. Each monopolist starts selling in each other's country if P_{rival} + transport cost > MC. This constitutes "dumping" not in the strict sense, but because the price received in the foreign market is less than that received in the home market due to transport costs. As a result, International trade in a homogenous product occurs, with each country both exporting and importing the product. While welfare tends to increase in each country because previously monopolistic sellers are now faced with a rival, there is economic waste in sending identical products past each other on transport routes.

4.1.9 Dynamic Trade Theories

Very early on, Mill noted that trade had a dynamic effect – creating an ability to acquire foreign capital and technology, stimulate entrepreneurship, and break the binding chains of tradition. These effects have only been built on recently, with several 'dynamic trade theories' being mutually complementary:

Product life-cycle theory posits that new products go through several stages (stage 4: saturation and stage 5: decline are irrelevant here and left out):

1. **New product stage (Introduction):** product is produced and consumed in a developed (origin) country, firms, firms remain in that country because they wish to stay close to the market to detect consumer response. The product and its production process are in a state of change.

2. **Maturing product stage (Growth):** mass production techniques and more standardization is adopted, economies of scale are realized (unlike H-O). As foreign demand grows, the firm exports. However, the initial export surge is followed by a fall in origin country production and exports as production is shifted overseas (FDI).

3. **Standardized product stage (Maturity):** As competition becomes more intense, the lowest-cost producer wins, so developing countries export now.

Hence, comparative advantage is dynamic because the source of exports shifts throughout the product's life cycle. Continual innovation is the key to becoming a continually successful exporter. Empirically, evidence holds up in favour of PCT: e.g. electronic exports were a prominent export of US, before moving to japan, and now to China. Today, however, the location of first production may no longer be the R&D location, since MNCs already have overseas plants.

Fundamentally, H-O and PCT may be complementary and not competing theories: the PCT results may simply emerge as a result of different stages of production requiring different factor ratios, for which different countries' factor endowments are better suited.

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This creates a kind of **Kaleidoscopic comparative advantage (Bhagwati)** that is volatile and subject to change. Countries and companies will be very fearful of losing their comparative advantage, while the volatility of comparative advantage may result in greater labour and impede skills learning depressing wages.

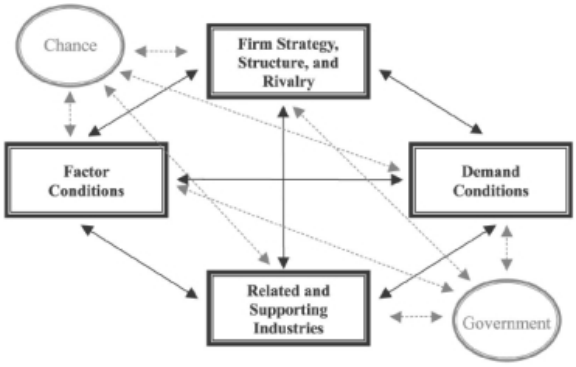
> *[Comparative advantage is] a kind of knife-edge, whee one day I have comparative advantage in X and you in Y, and tomorrow it may be the other way around, and then back again: a sort of musical chairs". (Bhagwati)*

> *A rolling stone gathers no moss and a moving worker gains no skills (Bhagwati)*

On the other hand, porter's principle of competitive advantage suggests that this may be a good thing, with global competition acting as a constant constant source of feedback to the firm on the efficiency of its production methods and the acceptance of its pricing policy, encourages X efficiency.

> *"It is one thing to train against the clock, but nothing beats hearing the breath of the runner in the next lane"*

From another perspective, **Porter's diamond** (national comparative advantage) questions how Switzerland and Japan became success stories without assumed prerequisites. According to Porter's Diamond, the determinants of national comparative advantage extend beyond factor endowment, and includes demand from sophisticated customers, an educated and skilled workforce, significant industry competition, and the existence of related and supporting suppliers. Porter also identifies external influences like government which can influence all 4 of the major determinants. Chance demand conditions like new inventions, significant shifts in exchange rates, input-price shocks (e.g. oil in 1973) can nullify the advantages of some competitors and bring about a shift in overall competitive position.



The crucial insight of this theory is that factor endowments are nothing more than the inputs to compete in any industry. The factors most important to competitive advantage in most industries, especially in those most vital to productivity growth in advanced economies, are not inherited but are created within a nation, through processes that differ widely across nations and among industries.

> *[The government's role is] as a catalyst and challenger; it is to encourage - or even push - companies to raise their aspirations and move to higher levels of competitive performance (Porter)*

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4.2 Effects Of Globalization

Using a definition from Bhagwati, economic globalization constitutes the integration of national economies into the international economy through trade, foreign direct investment, short-term capital flows, labour flows, and flows of technology. The reduction in transport costs and improvement in communication technology has led to a growth in globalization, but it is hardly a new phenomenon, with globalized trade known as early as the days of the Silk Road.

4.2.1 Trade Flows

> *"Markets are efficient, states are unnecessary, and markets perform best when left alone. Privatization and deregulation and open capital markets promote economic development, and governments should balance budgets and fight inflation and do almost nothing else"" (Washington Consensus)*

Trade results in both static gains due to comparative advantage, as well as dynamic gains due to economies of scale, X-effieicncy, technology transfer (the educative effect of trade), etc. (see 4.2). Opening up the Jamaican milk market to US imports in 1992 may have hurt local dairy farmers, but it also meant poor children could get milk more cheaply (Stiglitz)

This might come at the cost of vulnerability, however, but Philip Day describes how although exports of other Asian countries to the US has fallen due to the financial crisis, those to China have increased, and the total exports of those other countries are growing in a complementary fashion through increased trade with each other.

However, trade raises several issues:

> *Free trade can be shown to be beneficial to the universe but has never been proved to be the best policy also for a single country (Scitovszky)*

> *Free enterprise made this country. Free trade will destroy it. (June Collier, President national Industries inc.)*

Terms of Trade of developing countries: Sudden changes in the terms of trade can have major economic effects. In 1986-7, a drop in the price of coffee caused a 40% drop in ethopia's terms of trade and 6% of ethopia's national income (IMF). With rising world incomes, the price of developing countries' imports (income-elastic manufactured goods) have risen more rapidly than that of its exports (mainly income-inelastic primary products) have risen, leading to deterioriation of the TOT of LDCs. Furthermore, primary products are sold in competitive world markets, while manufactured goods sold in oligopolies that push prices up.

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Trade negotiations are accused of benefitting the DCs disproportionally. As markets were opened for industrial goods and the services exported by the advanced countries but not for maritime and construction services or agricultural goods and textiles in which developing countries might get a toehold, the LDCs' TOT have deteriorated significantly (Stiglitz)

Export instability is a particular worry especially for LDC commodity exports, since they are relatively price inelastic as they are frequently necessities or raw materials used as intermediates and not easily substituted, and LDCs tend to concentrate their commodity production in a small set of commodities. An IMF study found that the bulk of commodities have a shock half-life of more than 8 years, i.e., the commodity takes more than 8 years to retrace half the extent of the shock.

Distributive effects: The Stolper-Samuelson Theorem describe how with trade, the returns on the scarce factors (e.g. unskilled labour) fall, while the returns on abundant factors (capital, skilled labour) rise, resulting in greater inequality. Factor-price equalization works in the same direction.Where community indifference curves are intersecting, the welfare gains from trade may be ambiguous.

> *"Globalization has lifted profits relative to wages" (The Economist)*

While the SS-theorem does not strictly hold in reality, Munch and Skaksen (2008) find that wages are higher in Danish firms with high export intensity and highly educated workers but lower in high-export-intensity Danish firms with workers who have lower levels of education. Outsourcing, in particular, may put 30% of all jobs at risk (Blinder), leading to a squeezed middle class (the lowest class is unaffected because "office cleaning cannot be done by workers in India). Furthermore, the employer's ability to shift production has curbed bargaining power of workers in rich countries. Cases of IMF imposition of trade liberalization, occuring before safety nets were set up, resulted in those who lost their jobs being forced into poverty (Stiglitz)

> *"The theory of comparative advantage is often taught as if everyone benefits from trade. Technically that is not true. Total income grows, but there will be individuals who lose. Those who gain from international trade receive enough extra income from their activities that they could more than compensate those who lose when international trade commences, but if that compensation isn't actually paid (and it almost never is), then those who lose are quite rational to oppose international trade." (Lester Thurow)*

On the other hand, the depression of wages may be due more to technological change rather than globalization (2004 IMF paper).

4.2.2 FDIs and MNCs

The average yearly outflow of FDI has increased dramatically from $25billion in 1975 to $1.4trillion in 2000, the most visible examples of FDIs being China and Mexican Maquiladoras. About half of Chinese exports come from firms in which foreign investors have at least some ownership share.

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FDI can be horizontal, duplicating the production process e.g. for market access but also forgoing scale economies, or vertical, i.e. breaking up the production process to reduce factor costs. FDI can also be Greenfield investment (establishing a new operation), or an acquisition/merger of an existing firm.

FDI tends to increase with pull factors like per capita GDP, GDP growth rate, infrastructure development, political stability, and push factors like higher home wage costs, and higher home profits to make funds available. Firms will invest if the benefits in terms of lower factor costs and market access outweigh the costs of foregone scale economies and economies of integration.

A clear benefit to LDCs is technological transfer (especially as per Kaleidoscopic CA), helping LDCs to scale the technological ladder. The capital inflow breaks the constraint of low savings, while its low volatility brings relative stability. In some ways, FDI quality is as important as quantity. Increased competition is observed in the product market, Siotis finding that MNC presence increased industry efficiency, pressuring domestic industries to 'catch-up' with MNC efficiency (Graham).'' However, local firms may be crowded out.

On the other hand, the capital movements may erode the CA of developed countries. Traditional CA did not envisage the degree of capital mobility and increased scope for shifting production processes to low-cost areas, with FDI, comparative advantage may be subject to a risk of sudden disappearance, as per Kaleidoscopic CA.

On the labour market in LDCs, MNCs may raise employment, but this is offset by reduced labour demand by local industries crowded out. Sweatshops are a contentious issue, but at the very least it may be a better alternative to no employment at all. It may not be the fault of MNCs – Graham found that most "sweatshops" were owned and managed by local entrepreneurs. Even if it is a problem, perhaps trade to increase good prices and hence wages may be the better solution to lift workers out of 'exploitation', rather than sanctions, which punishes both the innocent and the guilty. Fundamentally this is a problem with rule of law, not MNCs.

It is a similar case for environmental standards – it is alleged that MNCs engage in a race to the bottom, searching out the least-tough regulatory environment to cut costs. This is exacerbated by the corruption of political processes and the desperation of LDCs for investment, which gives MNCs disproportionate bargaining power. Nigeria, which depends on oil for 80% of their revenues, was willing to overlook environmental concerns to allow Shell to drill for oil. Yet, MNC factories often adhere to higher standard than local ones, if protection restricts exports, then production will move to domestic firms where even less attention is paid to the environment. The solution to pollution lies in measures that reduce pollution, not in measures that restrict trade. In fact, if an environmental Kuznets curve holds, dirty industry is but a stage of development; these countries will be able to devote more resources to environmental efforts as they get wealthier.

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FDI into uncertain legal environment raises questions about the protection of intellectual property, which is the very incentive for MNCs to innovate. For instance, one New Balance contract manufacturers in China produced excess sneakers, which it sold both locally and internationally. However Stiglitz argues that the increased profits from sales in the developing world was small, since few could afford the drugs, making the incentive effect limited. Unaffordable AIDS drugs sparked international outrage and forced drug companies to agree to sell the drugs at cost in 2001.

Performance requirements on foreign firms may be imposed, taking the form of a minimum % of local employees, maximum % repatriated profits, and so on. However, profit repatriation limits and profit-sharing can be circumvented through e.g. transfer pricing. Since the recorded prices are intrafirm, no market price exists and firm arbitrarily records a price for the transaction on the books of its two subsidaries. When subject to high taxes on profits, the figures may be manipulated to show the greatest profit in the least tax environment, hence minimizing tax.

4.2.3 Hot Money Flows

Capital market liberalization can, in theory carry some benefits. A deeper financial system results in a lower cost of equity, better corporate governance enforced by foreign shareholders, and possibly more disciplined macroeconomic policy. The bulk of capital flows today are between wealthy countries and are intended to reduce risk through asset diversification and fine-tuning of portfolios (Taylor).

However, capital market liberalization can leave havoc. A 2003 IMF survey found no robust proof that financial globalization helped countries grow more quickly. (Rogoff) Capital flows are pro-cyclical, flowing in and worsening inflationary pressures during booms, flowing out when it is badly needed, creating self-fulling crises unrelated to fundamentals, while robbing governments of an ability to set both interest and exchange rates (the open economy trilemma). IMF advocacy for capital market liberalization, in spite of Asian economies having high domestic savings and not needing foreign capital, was partially responsible for the Asian financial crisis. More recently, today's carry trades, borrowing in US dollars with low interest rates (due to the current monetary stance), to invest in higher-yielding emerging market economies has resulted in speculative bubbles forming in emerging markets. Yen appreciation due to forex speculation against the USD has resulted in a form of Dutch Disease, making exports uncompetitive.

On the other hand, it takes two hands to clap, and crisis-hit countries are often guilty of poor macroeconomic management as well. The stereotypical Latin American economies of yesteryear used to get into trouble through populist government spending, while the East Asian economies ran into difficulty because of excessive long-term investment. In the United States in the run up to the current crisis, easy credit, especially for housing, induced households to spend too much, while in Greece, the government borrowed its way into trouble.

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Some short-term capital controls may be necessary. Mahatir imposed capital controls (in the form of an exit tax) on during the 1998 Asian Financial Crisis. There is an economic case for this since capital outflows generate large negative externalities, justifying the exit taxes. This helped Malaysia to avoid a worse downturn. On the other hand, Thailand followed IMF prescriptions almost perfectly, but was still in recession more than 3 years later.

4.2.4 Labour Flows

> *"International trade in goods and services and flows of productive factors are substitutes for one another" (Carbaugh)*

Factors of production flow in response to differences in returns (such as wages and yields on capital) as long as these are large enough to more than outweigh the cost of moving from one country to another. This tends to improve economic efficiency, and an increase in migrants equal to 3% of the labor force in OECD countries could result in global welfare gains surpassing those obtained with the removal of all trade barriers (World Bank: Walmsly and Winters)

This tends to result in wage rate equalization (factor-price equalization), lower wages and higher returns on capital in capital-intensive developed countries (the Stolper-Samuelson result). Hence it is not surprising to observe labour wanting restrictions against immigration because new workers lower the wage rate, while capital owners favour immigration because it increases returns. Labour is generally more successful in lobbying for restrictions because of concentrated costs and diffuse gains to immigration. On the other hand, because of the limitations of S-S and H-O theorem discussed, empirical evidence suggests that a 10% increase in the immigrant share of the population reduces native wages only by 1%.

Developing countries receive substantial remittances ($150bn 2004 – World Bank), equivalent to more than 1/4 of GDP for some countries, and surpassing foreign aid as the largest source of foreign capital in dozens of countries. However, they may face substantial static and dynamic losses due to 'brain drain' i.e. the loss of the positive externalities generated by skilled labour, and if their education was subsidized, the emigration represents a loss of scarce capital on which a social rate of return was expected. It is true that skilled labour tends to emigrate more: the no. of Jamaican immigrants in the US divided by the size of the Jamaican population with tertiary education gave a figure of 70%.

Not all migration is permanent, the guest worker represents a reasonable compromise in most cases. While most firms in developed nations are not permitted to discriminate against permanent immigrants, a two-tier wages structure is allowed for short-term guest workers to fill gaps in the labour force, such that capital owners gain and labour does not lose. For instance, the German Winkelmann farming group employs Polish workers for 3 months per year. This benefits germany because it is difficult to recruit Germans to do this physically demanding job, as well as the Poles who can earn wages in 3 months that are equivalent to 150% of a year's pay in Poland.

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4.2.5 Economic Integration

Economic integration, short of full free trade, can take place in several ways

1. **Free Trade area**: members remove trade barriers among themselves but keep separate national barriers against trade with the outside world. Eg: NAFTA (from 1994)

2. **Customs Union:** members remove barriers to trade among themselves and also adopt a common set of external barriers. Eg: Southern Common Market (MERSOSUR), Argentina, Brazil, Paraguay and Uruguay in 1991

3. **Common Market:** a customs union, plus free internal labour and capital flows. Eg: the EU, 1992 onwards

4. **Full economic union:** the total unification of economic policies, including monetary, fiscal, welfare, trade, and migration policies. Belgium and Luxembourg have such a union since 1921.

Economic integration, being only a partial movement to free trade, is a second best alternative to free trade. It can result in trade creation i.e. shifting import sources from a domestic producer with higher opportunity costs to a member producer with lower opportunity costs, or trade diversion i.e. shifting import sources from nonmember countries with lower opportunity costs to member countries with higher opportunity costs, but whose products are cheaper because of the elimination of internal tariff. While trade creation improves economic efficiency, trade diversion detracts from it.

The economic integration is more likely to have positive effects the more the no. of countries participating, the more positive the initial tariff, and the greater the extent to which prices in partner countries approach the lowest-cost world price, if prices in the partner country approaches the low-cost world price, the more likely the effect of integration on the market will be positive.

Apart from static effects, economic integration also results in dynamic effects. The increased foreign competition tends to lower local firms' monopoly powers, giving more pressure to minimize costs and improve technology. Exposure to larger markets enables scale economies to be reaped. Furthermore, larger markets can incentivise investment by MNCs, which often seek foreign production locations based on the size of the market (inside the external trade barriers) that can be served by their affiliates.

However, there are also drawbacks – as with all other trade liberalization policies.

> *"[The NAFTA will result in] a giant sucking sound going south [as American jobs are shifted to the lower-cost Mexico]" – Ross Perot, presidential candidate (1992)*

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4.2.6 Overall Effects And Global Balance

> *Globalization itself is neither good nor bad. It has the power to do enormous good. (Stiglitz)*

> *The Economic performance of outward oriented economies (5% GDP@PPP growth) broadly superior to that of the inward oriented economies (-1% GDP@PPP growth) in almost all respects (World Bank).*

Curiously, Brazilian sociologist Cardoso invented the dependency thesis, arguing that poor countries would be relegated to a dependent status in the international economy. When he became President Cardoso of Brazil, however, he sought to take Brazil into more, not less, globalization.

> *Globalization as it has been practiced has not lived up to what it can and should do. In come cases, it has not even resulted in growth, but when it has, it has not brought benefits to all..... [it has] benefitted the few at the expense of the many, the well-off at the expense of the poor. (Stiglitz)*

On balance, globalization is a **Kaldor-Hicks improvement**, where the winners of globalization can more than compensate its losers, but not necessarily a Pareto improvement, since some lose. For developing countries, inequity may increase in the early stages of industrialization, then decrease as a middle class emerges (Kuznet's curve). Some redistribution is necessary, but redistribution, like a leaky bucket carrying money from the rich to the poor, carries inherent efficiency losses, such that the poor will not receive all the money that is taken from the rich due to administrative costs and taxes or welfare handouts reducing incentives to work.

> *"When goods do not flow across borders, troops will" (Bastiat).*

It is perhaps an inevitable force that has to be managed. **Beggar-thy-neighbour** policies incur a **fallacy of composition**: while one country may face high PED in manufactured good exports, so a price reduction increases export revenue, the demand facing all developing countries is less elastic. Substantial price declines may result if all LDCs follow the same path.

> *"After all, beggar-thy-neighbor policies will succeed only in making us all beggars." (Raghuram Rajan)*

Yet, special interests, infecting supranational organizations that in theory should improve collective bargaining can detract from this imperative. Stiglitz describes how at the WTO, countries are represented by their trade ministers, who represent the interests of the business community. This community consists of both exporters who want subsidies and producers who fear competition for new imports and desire to keep as many barriers to trade as they can. At the IMF, countries are represented by their finance ministers and central bankers, who typically come from and return to financial firms after their period of government service. This is a form of **principal-agent problem**.

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Global balance is important. Since the world does not export to Mars, not all countries can run trade surpluses at the same time, and the surpluses of China, Japan, etc mean that other countries simply have to absorb these goods and accept the capital inflows that finance their consumption – but each country tries to avoid this. There is a case for flexible exchange rates, which helps to combine trade interdependence with internal monetary independence, allowing each country to seek for monetary stability according to its own lights, without either imposing its mistakes on its neighbours or having their mistakes imposed on it (Friedman).

On the same theme of global balance, heavily indebted poor countries should be offered debt relief. Debt payments follow a Laffer curve, from the origin to a certain point, outstanding debt is expected to be fully repaid, but beyond this point, the market value of debt increases with face value at a diminishing rate, such that market value eventually decreases with greater LDC debt. When heavily indebted poor countries are in this segment of the Laffer curve, debt relief can increase the chance of paying debt due to lower expectation of future tax increases and greater investment. However, creditors face concentrated costs and diffuse gains when forgiving debt, giving them the incentive to free-ride on the goodwill of other creditors, leading to a collective action problem where all creditors have to have to forgive debt as a group.

The IMF is in theory the guardian of global stability. However, its intervention programmes have caused huge problems. IMF-imposed austerity resulted in a fall in living standards in debtor countries as they compressed imports, and AIDS increases in Thailand as health programmes were cut. The so-called successful IMF bailouts of the early 1980s have left many Latin American economies (except Chile) with persistently high unemployment. Imposition of Washington consensus programmes was not always appropriate: when Keyna liberalized its financial markets in 1993-4 on IMF insistence, it resulted in 14 banking failures.

> *While the IMF provided 23bil to Mexico to support the exchange rate and bail out creditors, the far far smaller sums required to help the poor were not forthcoming. Fuel and food subsidies for the poor were drastically cut, and riots exploded. Even if one cared little for those who faced starvation, it was simply bad economics. Riots do not restore business confidence. (Stiglitz)*

The IMF has a dogmatic focus on macroeconomic indicators rather than structural issues. It insisted on the privatization of state enterprises, turning losses into profits by cutting the payroll, while not taking into account the social cost of unemployment. Privatization needed to be part of a more comprehensive program, creating jobs in tandem with the job destruction privatization entails. It also forced 25% interest rate hikes on South Korea even though it recognized that South Korea's companies were heavily indebted with high leverage, such that the rate hikes resulted in bankruptcy. The IMF pegged Argentina's exchange rate too high (1 peso=1 dollar), creating $155 billion external debt by 2001, and over 20% unemployment. Also, in practice, conditionality often fails because of fungibility: money going in for one purpose as insisted frees up other money for other use, so the net impact may have nothing to do with the intended purpose.

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4.3 Trade Policy

4.3.1 The Incentive To Protect

Payoff [A,B]		Country A	
		Free trade	Protect
Country B	Free Trade	100, 100	120, 50
	Protect	50, 120	60, 60

Game theory explains why the dominant strategy of national governments is to protect, since this yields a higher payoff whether the second country decides to engage in free trade or protectionism. Free trade imposes concentrated costs and diffuse gains, while the harmed individuals are more effective at pursuing their interests since the gainers suffer from a free-rider problem. Of course, this incurs a fallacy of aggregation since each government maximizes their own country's welfare, yet world welfare as a whole is not maximized.

> *"I do not know much about the tariff, but I know that when we buy our own products we get both the goods and the money, but when we import goods we get the goods and the exporting country gets the money." (often attributed to Abraham Lincoln)*

Many seem to have mercantilist ideas: "Trade is good, but imports are bad". However:

> *"Imports are the real fruits of trade because the end goal of economic activity is consumption." (Federal reserve bank of Dallas)*

Protection takes several forms:

- Tariffs, including offshore assembly provisions where only the foreign value-added is taxed. Tariffs often have different impacts on different stages of production, e.g. the assembly industry and parts industry in automobile manufacturing.
- Import quotas, raising domestic prices with the extra revenue accruing to producers rather than the government.
- Export subsidies, which also worsen the terms of trade by lowering export prices
- Voluntary export restraints, which work quite like import quotas. For instance, Japanese car manufacturers chose to undertake VERs to pre-empt US protection
- Restrictions designed to keep out imports. When Mississippi Delta catfish farmers found themselves subject to Vietnames import competition Congress stipulated that only one American-grown family of the 2000 types of catfish, could be called catfish, the Vietnamese had to sell under different names not recognizable to consumers. In the same line, the EU bans GM food imports.
- Procurement rules, e.g. the Buy American act - federal agencies must purchase products from US firms their price exceeds that of foreign suppliers by more than 6%

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4.3.2 Losses Due To Protection

> *The statements, 'I understand the principle of comparative advantage,' and 'I support free trade,' have become part of the economists' credo. (Krugman)*

Tariffs generate an obvious inefficiency. The Smoot-Hawley bill of the Great Depression era Smoot-Hawley slapped very high tariffs (average 50%) on US imports. Retaliation resulted in world trade shrinking dramatically, with 41% of decline due to the trade barriers, and 59% due to fall in income, worsening the Great Depression. Howard wall found that reduction in US imports due to tariffs imposed a welfare loss of 1.4% of GDP (1999).

> *"Internaitonal trade seems to be a subject where the advice of economists is routinely disregarded" (Baldwin)*

The negative impact of protection is often underestimated because of the failure to consider secondary effects outside the affected industry. American steel tariffs, for example, may have caused even more job losses in industries depending on steel imports; steel-using industries account for 57 times as many jobs as steel-producing industries. Directly unproductive profit seeking (Bhagwati – 3.6) activities can add significantly to the deadweight cost of protection.

> *There is no such thing as favouring producers over consumers. Each of us is a producer, typically from nine to five, and a consumer the rest of the day (Krugman)*

4.3.3 Reasons For Protection

> *"If apparent costs only equal true costs under conditions of perfect competition, and competition hardly ever is perfect, the bottom seems to drop out of the free trade argument. This is in fact a fair description of the state of mind which quite a number of economics students seem to have reached" (Hicks)*

Dumping: Dumping is just another form of predatory pricing, constituting unfair competition and ultimately resulting in monopoly power. WTO rules allow retaliatory tariffs in cases of dumping. However, it is difficult to acertain dumping. In 1994, Russian aluminium exporters were accused of dumping. However, they might merely have been selling at international prices, which fell because of low demand, and above their cost of production which was low because of excess capacity and cheap Russian electricity. There is an incentive problem here, since the department of commerce simultaneously acts as judge jury and prosecutor, estimating costs based on best information available, typically provided by American firms trying to keep out foreign competition.

Labour and environmental standards: Lower environmental and labour standards of overseas rivals are construed as a form of 'social dumping' due to unfair competition, permitting countervailing import duties. However, the difference in standards between countries may simply legitimately reflect different priorities among nations in their objectives, and the same general standards e.g. on pollution has non-neutral effects on CA.

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Second only in political appeal to the argument that tariffs increase employment is the popular notion that the standard of living of the American worker must be protected against the ruinous competition of cheap foreign labour – Stoper and Samuelson

Domestic problems: Protection is often proposed as a solution for BOP deficits, industries vital to natural security and unemployment. In all these cases it does not address the root cause. In the case of security-vital industries, production subsidies may be better than import tariffs, since the burden of protection is borne by all taxpayers who benefit and not just by the consumers of a particular product. Trade adjustment assistance i.e. allowing workers displaced from tariff reductions to petition for additional unemployment compensation or retraining help is better than reimposing tariffs.

Import-substitution industrialization, aimed at encouraging domestic industries by limiting competing imports, was the trade policy adopted by many low and middle-income countries before the 1980s. It is a historical fact that the world's 3 largest markets, USA, Germany, Japan all began their industrialization behind trade barriers. South Korea engaged in import-substituting industrialization before proceeding to export-led growth. Import-substituting industrialization worked in Latin America in the 1950s-60s, however, by the mid 1980s, many governments had lost faith in import substituting industrialization and began to liberalise free trade.

On the whole, import substantiating industrialization has failed, almost everywhere, trade has been good for growth (The economist).

The biggest success of export-oriented industrialization was East Asia, which adopted trade policies that promoted exports in targeted industries. However, it is not clear whether trade led to growth or growth led to trade. Also, the growth might have been due to educational policies.

Infant industry: Infant industry protection may be necessary and justified as a second-best measure to correct domestic market failures in developing countries:

- Imperfect financial markets, so savings from from traditional sectors such as agriculture cannot be channeled to finance investment in new sectors. High tariffs help to increase profits in new industries, compensating for imperfect financial markets
- Appropriability problems, where firms may not be able to appropriate the benefits of their investments (physical or R&D) because these are public goods, so insufficient investment is undertaken. If establishing a system of property rights is not feasible, then high tariffs would be a second-best policy to encourage growth in new industries.

The best way to address domestic distortions was through domestic policy interventions, and that in these cases protection was at best a second-best measure (which might be necessary if the first-best measure is not possible). Betting on the wrong horse is often a costly strategy.

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Strategic trade policy: Since CA is dynamic, and patterns of specialization achieved by 'historical accident', then there may be role for government to play in strategic trade policy. Export subsidies and import protection can achieve learning effects and improve technological performance, enabling domestic producers to realize economies of scale, recouping R&D costs, so as to eventually have an advantage over foreign rivals (Krugman). Export cartels, i.e. joint ventures for exporting may allow the sharing of fixed costs and pooling of expertise so as to penetrate foreign markets.

The Brander-Spencer model illustrates how a government subsidy for one firm could give it a strategic advantage over its rival. One example would be Airbus, which received state aid, especially in its early years when the company failed to make a profit. Initial payoff:

Payoff [Airbus, Boeing]		**Boeing**	
		Enter	Stay out
Airbus	Enter	-10, -10	100, 0
	Stay out	0, 100	0,0

Following subsidy of 20 for Airbus, regardless of Boeing's actions, it is profitable for Airbus to enter, but Boeing will lose money if it enters along with Airbus. Thus, Airbus will enter, and Boeing won't. Airbus' profits have gone from 0 to 120, despite the fact that the subsidy was only 20—the extra 100 represents a shift of wealth from Boeing to Airbus.

Payoff [Airbus, Boeing]		**Boeing**	
		Enter	Stay out
Airbus	Enter	10, -10	120, 0
	Stay out	0, 100	0,0

In recent years Airbus has become very successful, capturing a larger and larger share of the world commercial aircraft market. Without Airbus, the civil aircraft market would have been dominated by two American firms, Boeing and McDonnell Douglas (and possibly one, if the 1997 merger had still gone ahead), so the presence of Airbus promoted competition. Economic spillovers from the Airbus Consortium, such as skills and technology developments, might be expected to benefit other industries.

On the other hand, Baldwin estimated that both Europe and the US lost welfare, the only winners were other countries who enjoy cheaper planes. It is also necessary to pick the right winners. Paul David explains how historical factors can lead to an inefficient allocation of resources becoming "locked in", e.g. production of an inferior technology, locating an industry in an inappropriate area, or have other countries 'lock in' an advantage with timely government intervention, and thereby be locked out.

> *"The proverbial road to hell is paved with well-meaning industrial development plans (Rodrik)*
>
> *"What distinguishes a good industrial policy is not the ability to pick winners, but the guts to let losers go." (Hausmann)*

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4.3.4 The Role Of Governments

In light of Porter's diamond, governments may have the roles of

1. Enabling markets by ensuring the rule of law, property rights, and public infrastructure. This may involve exploiting agglomeration benefits (high growth industries e.g. previously chemicals, now biomedical) and positive externalities from information and learning spill-overs

2. Regulating markets, including supervising the financial sector, ensuring competition, and taxing negative externalities, and shifting towards lighter regulation accompanied by risk-based supervision.

3. Stabilizing markets through macroeconomic policy.

4. Legitimizing markets by facilitating difficult transitions, redistributing incomes, or providing social safety nets, so as to maintain public support for market-oriented policies

4.3.5 International Cooperation

> *"Free trade is not passe, but it is an idea that has irretrievable lost its innocence" (Krugman)*

The **nonreciprocity principle** holds that the plight of the developing countries in the international economy requires special discriminatory measures in their favous. So while developed countries may reduce barriers on exports from developing countries, no corresponding behaviour should be required of developing countries, allowing them leeway to utilize utilize uniform revenue-raising tariffs and temporary industrial subsidies since they have limited tools to deal with consequences of trade liberalization.

In practice, however, Western countries have been accused of much hypocricy, pushing poor countries to eliminate trade barriers on western exports (e.g. technologically-intensive products), but kept up their own barriers to LDC exports (e.g. farm goods). Thomas Hertel and Will Martin found that the average tariff that rich countries place on manufactured goods from LDCs is 4 times the average tariff they place on each other's goods

International buffer stock agreements may help to minimize volatility of price movements. However, if the price range does not contain equilibrium price, it is not workable. International sugar, tin, and coffee agreements failed because shocks lasted too long.

Compensatory financing: In a similar vein, export revenue instability can be compensated for by extending short-term compensatory financing loans if earnings fall below forecast, helping LDCs to better plan economic strategies.

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5 Exams & Readings

5.1 Exam Strategy

General comments

1. ATBQ
2. Use examples to illustrate where relevant
3. Interrogate the question. Examine all keywords and what they imply. Some questions have two hinges e.g. hidden discussions on philosophy of economics
4. Define key non-trivial terms or provide criteria as proper for formal academic writing. E.g. 'substantially' needs interpretation
5. Consider cases and exceptions. There is no one magic way out.
6. Evaluate, insight. – it must be a discussion
7. "To the extent that"

Essay

1. Address preamble and quotes
2. Take interesting lines of query.
3. What else might the question mean? Look out for logical fallacies, unstated assumptions

Case study

1. Interrogate the data. Use case evidence and note subtle implications, do not accept sources at face value; note limitations of the sources. Where conceptual knowledge is given, they tend to be employed in one case study questions.
2. Consider correlation versus causality
3. Isolate the economic concepts

Style

1. Name the anonymous economists
2. Avoid H2 diagrams
3. Balance: avoid hyperbole
4. No 'in my opinion'

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