I. Legal and Political Institutions and Economic Development

1. During the past 15-20 years, the growth and development literature has begun to take institutions and norms seriously. That is to say, a good deal of that literature now attempts to demonstrate that institutions and norma affect growth rates--and a good deal of statistical evidence now exists that such factors do affect growth.
    - The "normal" development economists, who have long stressed capital accumulation, have not completely given up, but a broad range of studies now demonstrates that a variety or economic instituions can help encourage economic development.
2. Another somewhat controversial literature attempts to link standing economic policies with political institutions (and/or norms). Much of that literature suggests that democracies (well-functioning ones with competitive elections, an open press, etc) tend to produce better policies, on average, than dictatorships.
3. The purpose of this lecture is to show why legal institutions tend to be important, why political systems matter, and why norms may affect growth rates and income levels.
    - This block will conclude by working through a few of the more famous papers that explore connections between politics and norms. (See the website for links to several of these papers.)
    - It begins by going over some basic ideas from Law and Economics--it turns out that laws are very likely to have evolved to support prosperous societies--although not all societies have equally productive legal systems.

II. The Productivity of Property Law

1. Ordinary economic exchange is in many respects an ideal model of interactions between individuals. Exchange only takes place when both parties expect to benefit--that is to say when each person values the thing received more than the thing given up.

    A. In a pure barter economy, exchange requires what is called a coincidence of wants and well enforced property rights.
        - The usual diagrammatic representation of the mutual gains from trade is the Edgeworth box.
        - [Illustrate]
        -

    B. In the abstract models used by economists, the price system alone is often sufficient to generate efficient outcomes at which all potential gains from trade are realized.
        - That is prices induce sellers to bring supplies to the market in the pursuit of profit and causes buyers to arrive with the expectation of personal gains from trade (CS).
        - The traders in an "Edgeworth Box" simply maximizes their own utility by attempting to get the best combination of goods (the utility maximizing combination), given market prices.
        - The prices are often, in effect, simply called out by "the auctioneer" they make decisions about whether buying or selling most advances their interest.
        - However, in the real world the alternatives may not be limited to the simply "buy" or "sell" alternatives of an Edgeworth box.

C. To limit choices to such "legal" choices implies that trades take place in a legal environment in which both modern Western property rights and contracts are enforced.
   - The existence of an external regime of laws is implicit in essentially all economic analysis.

D. Similarly, the Solow-type growth models of the 1950-1990s suggests that economic development is all about capital accumulation. Essentially, the more capital a laborer has, the more productive he or she is and the higher GDP is.
   - However, economies with the same labor and capital may have produce quite different levels of GDP according to how they are employed.
   - Moreover, institutions (law enforcement and private property rights) will affect incentives to save and invest in both human and physical capital.

2. In order to understand the contribution that property rights makes to economic development, let's consider first what might be called the **Hobbesian dilemma** (named after an English Philosopher from the 1600's, Thomas Hobbes).

A. Suppose that Al and Bob interact in a setting in which property rights are not enforced, so there is no penalty associated with attempting to steal property from one another.

B. To simplify, suppose that each person controls several his or her own labor and can use that labor to either harvest nuts or to attempt to steal nuts gathered by the other person in the community and/or to protect his or her nuts from theft..
   - To simplify even further assume that there are 4 blocks of time and that the use of time to defend one's own nuts or steal from the other are equally productive.

C. This setting can be represented with a game matrix that is very similar to a Prisoner's dilemma game, although it has more than two strategies.

Hobbesian Dilemma

Al's effort \ Bob's effort stealing or defending	0 hours stealing	1 hour	2 hours	3 hours
0 hours	12, 12	6, 13	3, 14	0, 15
1 hour	13, 6	9, 9	4, 10	1, 12
2 hours	14, 3	10, 4	6, 6	2, 7
3 hours	15, 0	12, 1	7, 2	3, 3

Payoffs are in bags of nuts, net benefits, or utility.

D. Since each person has an interest in maximizing their income (net benefits, utility), each person turns out to invest 3 hours in stealing nuts from the other or defending their nuts from the other.
   - The result is a dilemma because too little time is invested in harvesting nuts.

- The total output at the Nash equilibrium is 3,3 which is far below that associated with no stealing.

E. The dilemma is that each would be better off if each had spent all of their time gathering nuts rather than protecting their stash or stealing from the other.
   - Many of the alternative payoff combinations are Pareto superior to the Nash equilibrium!

F. Escape from this dilemma will require a change in incentives.
   - Note that simply agreeing not to steal is not credible, because each has strong incentives to cheat on the agreement.

3. One possible solution would be to "hire" a property right enforcer to punish persons whenever they spend time stealing.

   A. Note that Al and Bob can afford to pay for the enforcer up to 14 bags of nuts for a solution to their Hobbesian dilemma. (Explain why.)

   B. Note also that a penalty for stealing of just **3 bags of nuts per hour** would be sufficient to discourage theft in most cases.

   C. To see this, assume for for now that every hour of theft is punished. This produces a new game with different payoffs and a new Nash equilibrium. At the new equilibrium no theft (or very little theft) takes place.
      - As an exercise write down the payoff matrix associated with this 3-bag penalty scheme.
      - Find the Nash equilibria (there may be more than one).
      - Determine whether the equilibria are Pareto efficient or not.
      - If they are, then the dilemma has been solved.
      - Is there a smaller fine that could have acheived the same result?
      - How is the smallest effective fine affected by imperfect enforcement?

4. This system effectively creates "ownership" in the bags of nuts that one produces, but not for bags of nuts that one steals.

   A. The enforcer does not really PREVENT Bob from stealing Al's nuts or vice versa, but rather imposes penalties that discourage theft. And so, protects both Al and Bob's property.
      - Indeed, given rule and the enforcement, it could be said that the law establishes property. In this case, the law and its enforcement creates very basic property right system in which the producer of wealth controls it (net of required payments to the enforcer).

   B. This law increases society's wealth, even though it is not an ordinary input into production, and even though law enforcement is costly.
      - GNP increases from 6 to 20 (less the fee to the enforcer).
      - And, personal wealth or income increases from 3 to 10 (less their share of the enforcer fees).
      - Note also that in equilibrium no fines are collected in the community in the case modeled.
      - (In more complicated games [non-symmetric ones] the same expected fine might not prevent all criminal activity. Explain why.)

5. This property right solution to the Hobbesian dilemma clearly solves the immediate problem.

   A. However, but there is unfortunately the problem of enforcing the contract with the enforcer.
      - An organization that is strong enough to enforce this law may be able to simply take Al and Bob's production for himself.

B. How does one avoid this problem?
- This is a problem in Constitutional theory, which we will ignore until later in the course, but do keep it in mind.
- Constitutions often include other procedures through which government agents are punished including fines, jail time, and simply losing office.
- It is also possible that property systems may emerge even within fairly "nasty" enforcers, who create property right systems to profit from them. In such case, the controling the enforcer problem is not solved, but simply lived with.

III. Property Rights as Solutions to Commons Problems

1. There are many other social dilemmas where the result of private optimization is less than the best that can be achieved by all affected parties. Many of these can also be solved by laws that establish "legal rights" of various kinds.

2. Another example of an externality problem that helps to explain the emergence of property rights (the right to exclude), is the commons problem ("tragedy of the commons")

   A. The tragedy of the commons involves the excess use of a resource that is freely available to all who wish to use it.
   - This is not the same problem analyzed in the Hobbesian example, because the resource of issue is initially used by all who wish to use it.
   - For example, in medieval Europe there were often common pasture lands or forests that could be used by the peasants for their own cattle or firewood.
   - Note that air and water supplies are often used as commons these days. They are freely available to all that wish to use them.
   - The oceans largely remain "commons" for fishing firms.

3. The **commons problem** arises when a common resource is *over* utilized in equilibrium, that is used at a rate that diminishes its overall output.

   A. This excess usage tends to happen because individual users bear only part of the cost of using the common.

   B. Each user's use reduces somewhat the reduced productivity other persons using the commons, but this cost can be ignored by all users when they make their decisions.
   - That is to say, a negative externality problem occurs, and the result is over usage.
   -
   -

The Tragedy of the Commons

Herd Size	Bob: Small Herd	Bob: Large Herd
	A, B	A, B
Al: Small Herd	3, 3	1, 4

Al: Large Herd	4, 1	2, 2

4. Analysis of the Illustration:

   A. Note that regardless of what Bob does, Al has an incentive to place a large herd on the commons. Note that 4>3 and 2>1. (Use vertical comparisons for Al)

   B. Similarly, regardless of what Al does, Bob has an incentive to place a large herd on the commons. Again 4>3 and 2>1. (Use horizontal comparisons for Bob's payoffs.)

   C. Thus both Bob and Al will graze large herds and the pastures output of beef falls to 4 (2+2) from 6 (3+3).

   D. [The commons problem can be considered to be a special case of the "Prisoners Dilemma Game."]

   E. Note that there are potential gains to trade that both Al and Bob could realize if they could each agree to restrain themselves from placing larger herd sizes on the commons.

   F. On the other hand, if they agree to place small herds on the commons, each may cheat--note that there remain incentives for each to graze large herds on the commons.

   G. [Illustrate this with a total and average product table for the pasture as a whole.]

5. This land management problem can addressed by "privatizing" the commons.

   A. Privatizing gives complete control over a particular parcel of land, or other resource, to a single individual, group, or firm.
      - The "owner" or "controller" will have the right to use the resource in a broad variety of ways and have the right to exclude others from that resource.
      - In this way, the resource becomes that person's property.
      - Note that this is another economic justification for an "ownership" type of rights system.
      - Again, as in the Hobbesian case, that right will have to be enforced.
      - That is, trespassers will have to be punished in some way to discourage "theft" or "theft of services" in this case.

   B. The individual or firm given control has private reasons to maximize output from his/her resources (property). Increases in output normally increases wealth, which increases one's opportunity set and utility (net benefits).
      - "Owners" will choose the herd size on their pasture that maximizes output.
      - By dividing the commons up and granting control over the various pieces to individuals or small groups, the "commons externality" is eliminated in this case.
      - And, output from the former commons (lake, field, forest, etc) is maximized.
      - In cases where there are no other externalities, the result can be very efficient, although so far we have **not provided** an explanation for "tradable property rights.

   C. (I believe this to be one of the main reason for property rights of this sort--whether they include the right to exchange those rights or not.

- For much of world history, the right to exchange such rights was far less common than the right to exclude others from a resource.

6. Underlying Economics: Maximizing Output from a Natural Resource

A. The "commons game" examined above is a simplifications of the actual structure of commons problems. Generally, more than two person are involved, and each person has more than two utilization rates. However, the main logic of the setting is illustrated in the simple 2x2 game.

B. The payoffs in a common game are determined by the productivity of the common resource. For a given technology, any finite resource has a maximum output, and consequently an output-maximizing rate of use (heard size, annual timber harvest, catch, etc.).
- A commons problem emerges when a communal resource (grazing area, wood lot, fishing area, river, lake, air ...) is over used in the sense that **equilibrium** total output from the resource **is lower than it can be**.
- The above "commons" game illustrates that such over use can be individually rational, in the sense that no person has an incentive to alter their strategies (use rate) given the others.

C. The connection between individual choices about use rates (herd size, timber harvest, catch, effluent removal, ...) **can be made sharper by specifying a production function** for the resource of interest, and then finding out the payoffs received from various combinations of use rates by individual herdsman, lumberjacks, fisherman, polluters, etc.
- It is the production function for the commons that generates the payoffs for commons users.
- (1) Assume a production function for a common resource (field, forest, lake, etc.) and further assume that it has a maximum output. (To keep your illustration manageable it should occur towards the middle of the game matrix that you will develop.)
- (2) Use the production function to determine the average output from the commons with different numbers of inputs (head of cattle, fishing boats, etc)
- (3) Calculate the payoffs for each player in each cell. Remember that every unit of input is average and that the total number of inputs is the sum of the inputs of both players for the cell of interest. The total number of inputs determines the average product for the cell, the payoffs are simply each player's own number of inputs time that average product.
- (4) Determine the Nash equilibium (or equilibria) of the game.
- Determine whether the result is Pareto optimal or not. If not, there is a commons problem.
- [Note that not every commons produces a problem--especially in discrete forms of the game.]

D. [**See the class notes or website for a matrix representation of this and/or class notes** for an example of this. Redo the example using a different production function. To develop a multi-strategy production-function-based version of a commons problem:
-

E. Puzzles
- Many economists advocate the privatization of all current communal resources, such as rivers and lakes. Discuss how such privatization can potentially solve commons problems.
- Discuss other problems that might be associated with selling a major river, say the Monogahela to a single owner.
- Are there cases where privatization will not solve a commons problem? Explain why?

7. These two examples demonstrate that societies that adopt legal systems in which (i) producers have rights to their output but not to items stolen and (ii) in which land use rights are assigned to individuals or small groups (to exclude and use) will tend to be more prosperous than societies without those rules.

   A. In societies that live at the margins of survival, long run prosperity is important, because it helps support healthier populations and provides a "surplus" that can be used to provide local services (such as enforcing these laws and defending their community from outside raiders).
      - The success of such communities will be copied by many others, which causes effective rules to spread throughout a region--or throughout the world.

   B. It is interesting to note that such rights are very widely used, but in many places the right to use and exclude were not always combined with the right to sell.

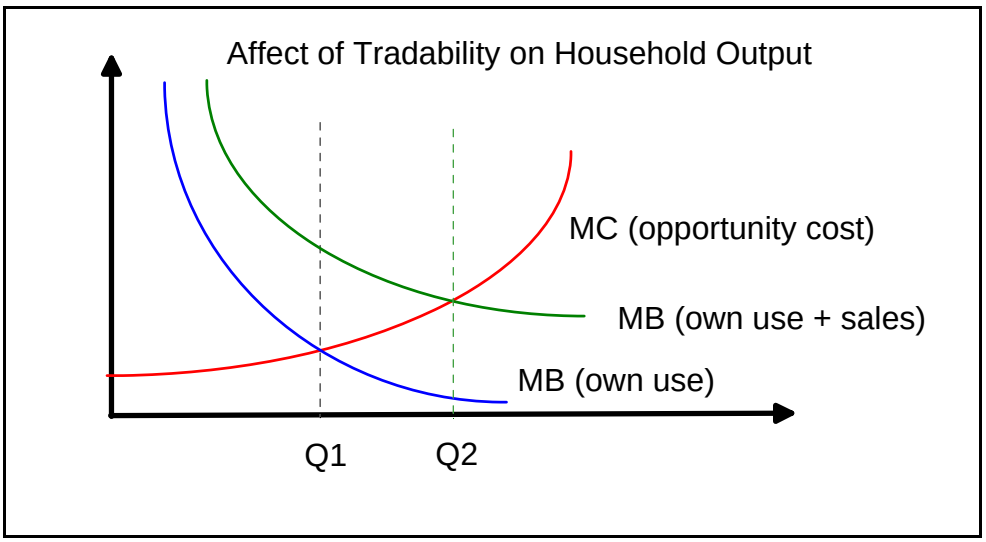
   C. These rights were more common for things that were produced (agricultural products, pottery, etc) than for land. We will provide a possible explanation such rules in the next section of the course.
      - A classic example of land "ownership" without the right to sell is the strip farms of medieval society.
      - Another is the manner in which rights to offices in business operate, in which the person with his or her name on the door has the right to use and exclude, but not to sell the office.
      - Similar rights packages are also obtained by renters.
      - The models that we explored above provide an economic rational for such rights systems.

IV. Law as a Means of Increasing Specialization and the Productivity of Markets

1. In the previous lectures, we demonstrated that establishing "rights" to use and exclude can increase economic output by (i) shifting personal resources from unproductive to productive activities (from theft to production) and (ii) encouraging more efficient use of locally available resources (privatizing communal land). We next explore economic reasons why other rights might developed and why limits to those rights may also be part of the law governing those rights.

2. The next step in our analysis is to provide an explanation for tradable rights and for places where rights may be sold (stores).

   A. There is a sense in which once rights to use and exclude are established, one might expect trade to take place automatically.
      - But this is clearly NOT the case.
      - For example, most of you have rights to use and exclude others from your bedroom at home (or in your rental housing in Morgantown).
      - Yet no family markets in bedrooms emerges. Indeed, many parents would resist the idea that one of their children might sell their bedroom to his or her brother or sister--and resist even more so the idea of selling one's bedroom to someone outside the family.
      - Even on smaller portable things, such trades are rare. Children rarely trade their toys to one another, even if it is permitted by their parents.



- (Note that within families, parents often establish and enforce a family's intra-familial legal system, which may well be how such systems originated in the distant past.)

B. These examples suggest that tradable rights systems are less intuitively than one might at first have thought--even after individual rights to use and exclude have been established.

3. It is likely that legal systems would adopt tradable rights systems first in areas of life in which the gains from trade are the greatest in physical terms--that is to say, in areas in which physical wealth would be increased by such rules.

A. Note that mere barter or preexisting goods would not have much affect on physical wealth.
- There may be gains to trade (improved subjective welfare), but the physical wealth is the same both before and after a trade takes place.
- This may be one reason why intra-family trading systems are rare.

B. However, in cases in which a tangible output is produced, the opportunity to sell (transfer one's rights to exclude and use) will increase physical output.

4. An Illustration

A. Consider the case of a person that makes pots out of clay (a potter).

B. In the absence of the right to sell his or her pots, the potter would make just the number need for his household uses for storage and for eating.

C. Given the opportunity to trade them for other things of value (whether money or in barter transactions), the potter would produce no less, and is likely to produce many more pots.

D. The right to sell goods that are produced, thus, is very likely to increase physical wealth.
-
-
- In this example, the opportunity to trade one's pots for other things of value (potatoes or wine) increases the potter's output from Q1 to Q2.
- Note that a similar increase will be induced on the potato farmer or wine maker.

- In this manner, allowing exclusion and use rights for produced goods to be traded tends to increase output--more or less automatically as producers take advantage of opportunities to produce for sale.
- Indeed, the remains of pots that are thousands of years old exist in most parts of the world, because such rights systems were widely adopted.
- (Note that this "trade effect" occur even if not all goods or assets are tradable. The right to sell land, for example, have often been very limited [encumbered] at the same time that produced goods were more or less freely marketed. However, at least two goods have to be tradable for this effect to occur. (why?))

E. Since many things that people use are produced in one way or another, a general right of this sort will increase outputs of a broad range of goods, including goods that might be used as inputs for productive activities (potter wheels and hunting arrows)--and for defense against or for attacking ones neighbors (spears and arrows, shields and body armor).

-
- Note that some **specialization** will take place as people produce for sale or trade, because gains to trade would not exist if everyone produced the same product. Insofar as people learn by doing, MC tends to fall and output is further increased.
- The latter provides a **military rationale** for making produced goods tradable, at least within one's community.
- The military rationale implies that communities that fail to adopt such rights systems (or manage to obtain similar outputs through central planning and coercion) will disappear, which helps explain why so many societies that we are familiar with have legal systems in which produced goods may be traded.
-
-

5. The Productivity of Markets and Specialization

A. Specialization tends to increase output because it allows one to "learn a trade," that is to invest in human capital so that one become more productive at a particular production process.

- Although many early trades did not require a lot of training, it is clear that a potter with training can produce more and better pots than someone without that training.
- Similarly, farmers who specialize in a few crops, tend to grow them with greater success than person without as much experience or training.
- House build by persons specializing in construction will build houses that are more durable and more useful than those built by amateurs, again because they have more human capital.
- Note also that this process of specialization makes efficient use of the distribution of talent within a community. A genius may rapidly learn all the early trades and be competent at them all, whereas an average person may learn just one or two trades, yet do those trades as well as a genius.

B. Specialization tends to increase output, by increasing productivity (lowering MC in the diagram above).

V. The Productivity of Contracts

1. The simple rights systems developed above does not apply naturally to team production, because with team production there is no single producer who can be "given" the rights to exclude, use, and trade the things produced.

   A. Moreover, there are a variety of team production problems (such as free riding) that need to be overcome to effectively engage in team production.

   B. Such production only is possible if the output is shared among team members in some predictable way that encourage each to work "for" the team.
      - If the strongest person on the team simply took all the output after it was produced, it is clear that no one would joint his team.
      - If such rights were simply shared, there would be both commons problems and shirking problems (another negative externality) associated with team production.
      - To make team production work--and so realize economies from such production processes, some systematic way of dividing up the output needs to be worked out.

   C. One possible solution is to write a contract (an agreement) among all the team members that specifies how the output (or money received from selling the output) will be distributed.
      - However, writing such agreements is not easy.
      - Moreover, those agreements will need to be enforced in some way, as true of the property systems above. (We will take up enforcement shortly.)

2. An illustration of team production problems and how they may be reduced through conditional shares of team output.

A Team Production Problem
(Shirking or Free Riding, with an equal shares contract)

Al's effort \ Bob's effort at production	0 hours	1 hour	2 hours	3 hours
0 hours	4, 4	4.75, 3.75	5.5, 3.5	6.25, 3.25
1 hour	3.75, 4.75	4.5, 4.5	5.25, 4.25	6, 4
2 hours	3.5, 5.5	4.25, 5.25	5, 5	5.75, 4.75
3 hours	3.25, 6.25	4, 6	4.75, 5.75	5.5, 5.5

The payoffs from working on the team are in net benefits (or utility), computed as below.

The team's total output is 1.5 (La + Lb) and each person gets half. The opportunity cost of labor (L) is assumed to be 4-L.
A team member's net benefit is his or her share of the output (.75*La+Lb), less his or her opportunity cost for working rather than shirking (4-L).
Ni = .75(La+Lb) + 4-Li

- The result is a dilemma, because too little time is invested in team production.
- Both people would be better off if they both worked more hours at team production.
- Too much time is spent shirking.
- (Note the similarity between this game and the Hobbesian conflict game. In both cases, too little time was spent in the productive activity.)

3. One possible solution that might be accepted by all team members would be to pay persons according to how many hours (or how hard) each person worked on team production.

   A. Perhaps surprisingly an hourly wage of $1.25/hour would generate a new payoff matrix with a better equilibrium.
      - Moreover, there is a residual that could be used to pay for organizing this system. If each person works 3 hours, they produce 1.5 (3+3) = 9, but are only paid (1.25)(3+3) = 7.5.
      - So 1.5 units of net benefits (dollars) are available for the person who solves the team production problem.

   B. However, even if a formeteur did so, his wage contract would still have to be enforced.
      - This might be done through "continuous dealings" where each player decides whether to participate on this team or not, base on whether team members have been properly paid in the past.
      - Or, it might be enforced through court proceedings, in which the formeteur would be fined for not paying his or her team members, with $F^e > 9$.
      - Or most likely, it would be enforced through a combination of private contract design, continuous dealings, and court proceedings.

4. Specialization may also lead to "team production" in which various persons contribute different inputs to producing a single output.
   - In such cases, it would be more difficult to substitute one team member for another and more important that the team production problems be solved.

5. Similar problems are also associated with trades in which timing issues are important.

   A. For example, one might provide a service at time T and one's partner is supposed to provide a service later at time T+L, but the second mover may not keep his promise and therefore cause the first mover to worse off.

      i. [Construct an game theoretic illustration of how gains from trade may fail to be realized because of timing and hold out problems. Assume that player A goes first and player B has a choice about whether to cooperate or not. Then given A's analysis of B's incentives, consider the equilibrium. Find a subgame perfect equilibrium--that is an equilibrium where the first mover anticipates the second mover'responses and makes an optimal "first" move, given that.]
      - Again enforceable contracts (promises) provide a method for solving such timing problems.

      ii. Note that such contracts may be more or less privately enforced through "continuous dealings," the posting of bonds, and/or reputation.
      - (Note that posting bonds may also need enforcement.)
      - Contracts and similar agreements **could also be enforced through a legal system** with courts and police.

   B. The fact that we all use such court systems suggests that there are margins at which norms of honesty, continuous dealings, and posting bonds fail to solve all such problems.

6. **SUMMARY**: To this point, we have found that there are economic efficiency rationales for legal systems that (i) give use and exclusion rights to producers and over land, (ii) make those rights tradable rights for persons who produce goods and services, and (iii) make promises

(contracts) enforceable, by threatening fines or imposing other fees on persons who violate (renege) on their promises (contracts).

A. Communities that have such systems will tend to be far more prosperous, other things being equal, than those that do not.

B. And, also such communities would be better able to defend themselves from attacks (and also to attach their neighbors.

C. Both these effects tend to make such communities more likely to survive in the long run.

D. Thus through "survivorship" and also through incentives to copy legal systems that work, such property systems would tend to become more and more common through time.

E. [In this sense at least, they may be regarded as "natural rights."]

F. We next examine in a bit more detail how law enforcement operates.

VI. On the Economics of Judicial Systems: the Economics of the Courts and Police

1. At this point in the course, it is time to think about formal mechanism for enforcing the above rights systems.
2. From the analysis developed to this point, it is clear that communities devise formal enforcement systems will tend to be far more prosperous than those that do not.

   A. Productive activities, specialization, and team production are encouraged through such systems.

   B. Prosperous communities are also better able to defend themselves from attacks (and also to attach their neighbors (although they may also attract more such attacks).
      - These effects tend to make such communities more likely to survive in the long run.

   C. Thus through "survivorship" and also through incentives to copy legal systems that work, such property systems would tend to become more and more common through time.
      - [In this sense at least, they may be regarded as "natural rights."]
      - The provides a partial explanation for the fact that so many ancient and contemporary societies have adopted various forms of court proceedings as a method of enforcing property and contract systems of law.

3. How to enforce such rights is by no means obvious, and most societies have developed complex court and police systems to do so.
   - The systems in place separate judicial from policing activities.
   - The systems in place use "hearings" at a particular place to determine "the facts."
   - The systems in place use testimony from the persons directly involved and other "witnesses" who have information that is relevant for determining whether a crime or other illegal activity has taken place and who is guilty.
   - Those proceedings normally have tough penalties for lying in court (perjury).
   - The systems separate responsibilities for (i) bringing person to court (arrests, summons, etc.) from (ii) the determination of guilt or innocence, and (iii) from creating the law itself.

4. The courts are information producing (truth producing?) institutions.

   A. Court officials (judges) often determine exactly what the law is in a given case.
      - Is property A, really Mr X's or Mrs Y's, and what rights over that property does the owner have?

   B. Courts often determine whether there has been a violation of the law and exactly what law was violated.
      - It is not always obvious whether a crime has been committed or not.
      - Nor is it always obvious what the proper punishment should be if a crime has taken place.
      - In criminal court, the proceedings normally identify the guilty (or innocent).
      - In civil court, the proceeding normally determine who is at fault and whether compesation has to be paid or not.

   C. Courts normally determine what punishments are associated with a particular crime.
      - They are normally constrained by legislation on such matters, but normally they have some discretion over the extent of the fine or other punishment.
      - This is partly through direct control over the fine is delegated to the courts and partly because determining what crime or civile problem has occurred determines what the allowed range of punishments is.
      - The penalties for involuntary manslaughter are different than ones for murder.

   D. The penalties vary by law and are sometimes collected by the court and sometimes transfers from one of the parties in court to others.
      - In criminal cases, fines normally go to the local government or court system.
      - In civil cases, court decisions tell one party how much and what is owed another.
      - (Note that as far as incentive effects are concerned, both systems have similar effects on the person paying the fines or paying the settlement damages. It provides incentives not to engage in the illegal activity.)

5. The separations of responsibilities evidently help to make the judicial system work better by reducing (but not eliminating) errors and corruption.

   A. For example, having the basic laws "set in stone" implies that the courts cannot simply make up laws and use them to punish their enemies or extract rents from them.

   B. The determination of guilt is made separately from the arrest decision. This allows a second review of the facts (and more facts to be presented) and so reduces the likelihood that an innocent person will be punished. It also reduces the ability of policemen to extort money from persons who they accuse of crimes.

   C. The court proceedings themselves are organized to collect information quickly and accuracy is increased by making "lying" to the court (perjury) a crime.
      - More or less similar proceedings have been used for thousands of years--although they are revised a bit from time to time.
      - As noted above, the use of witnesses and penalties for perjury to learn the facts of "the case" are ancient devices.
      - (Note that some lying is allowed, but not when under oath.)
      - (Lying itself is not always a crime in business or in the court, even if it is usually unethical!)

   D. The results are judicial systems in which laws are more or less uniformly applied and enforced.

E. If the right laws are in place, such systems will encourage economic development and civil society.

F. This is not to say that the courts always get it right.
- To deal with mistakes, most court systems have an appeal process, whereby those who feel that the wrong decision has been made can appeal to a higher court.
- The frequency of court mistakes can be estimated by the frequency with which an appeals court reverses the decision of a lower court.
- See Tullock for more on this.

6. Contemporary legal systems also divide the law into a variety of separate areas, many of which have their own courts and legal proceedings, as with civil law, criminal law, and family law.

A. Property law and contracts are two of the three main parts of civil law.

B. Violations of civil law in the course of "ordinary" business is normally dealt with differently than in extreme cases (criminal law).
- For example under civil law, if one is "wronged" one may sue and recover damages (eg be paid for one's losses.
- However, under criminal law, the fines go to the government (court or treasury).
- (Note that many crimes can be thought of as extreme forms of trespass. Explain.)

7. For now, let us assume that courts are reasonably accurate and that most times it is guilty (law breakers) rather than innocent persons who are punished.
- This allows us to focus attention on how court decisions about penalties affect the behavior of persons thinking about engaging in illegal activities.
- That some mistakes are made simply reduces the probability that a person engaging in an illegal activity will be punished for it.
-
- We will return to several of these issues later in the course.
- For example, Gordon Tullock also argues that the European judicial system is better than the US system, because he believes it to be less costly and more accurate.

VII. Expected Penalties--the Economics of the Law and Law Enforcement

1. To analyze the effect of the laws, economists always begin with the assumption that all actors are "rational."

A. That is it is assumed that people "think ahead" when they act and take account of their own costs and benefits.
- A net benefit maximiser will make choices that increase his or her net benefits.

B. For example, in this course we assume that consumers, firms, criminals, voters, and government officials are all rational--they all make decisions which maximize their net benefits..

C. Criminals are not assumed to be "crazy" in economic models, as they sometimes are in sociological models, but rather persons pursuing their own net benefits.

- Most policemen also believe this insofar as they try to identify suspects by thinking about whose interests are advanced by a crime and/or who could undertake the crime at least cost.
- (Most murder novels make similar assumptions, to make their plots more interesting.)

D. Given rational actors, law enforcement will affect the net benefits associated with illegal acts.
- Law enforcement increases the costs of illegal acts through associated penalties.

2. Economic analysis of criminals suggests that one does not have to use normative analysis to understand criminal behavior. **Criminal Behavior is simply behavior that is illegal, e.g. that is subject to punishment through the courts.**

A. Many, but not all, activities that are illegal can be given an economic explanation. That is "making X illegal increases GNP."

B. Decisions to engage or not in those activities are ordinary in the sense that they can be modeled with our usual maximize expected net benefit tools.

C. This approach to analyzing crime was first worked out in Gordon Tullock's (1971) book and in Gary Becker's more famous (1974) paper. Many other papers and books have been published since then that uses their model to analyze illegal behavior.
- According to their approach, every potential "criminal" is a rational agent interested in maximizing his EXPECTED income, net benefits, or utility, given some probability of punishment for his or her crimes (violation of property rights, breech of contract, etc).
- (Here it bears noting that these models probably work better for property crimes than violent crimes.)

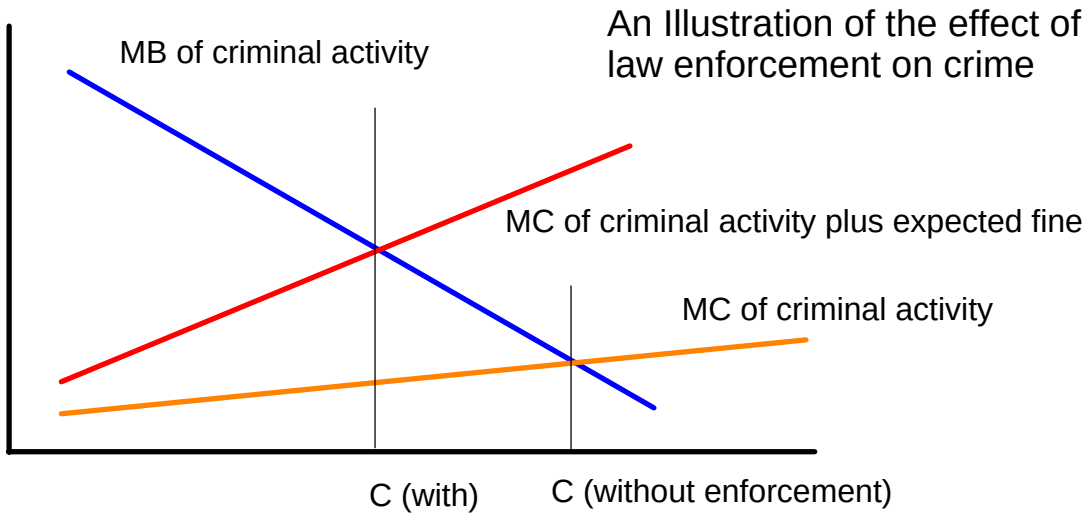
D. This is not to say that there is nothing unusual about criminals.
- Economics implies that criminals are not "random individuals" but persons who differ from non-criminals in their opportunity costs, assessment of risks, time discounting, and/or risk aversion from the perspective of economics.
- (Initially, we'll ignore internal norms that a person may have. An honest person man not care about the fine or probability of being caught, but simply that an activity is illegal or immoral.
- (Most economic analysis of the law assumes that people do not have such internalized norms, which is not always a good characterization of behavior.)
-

3. A model of criminal choice
- Assume that there is a MB curve that describes the benefits of criminal activity (which may be increases in personal income or some other benefit).
- Assume that there is a MC curve that reflects the potential law-breaker's opportunity cost of engaging in crime.
- Assume that there is a law enforcement system in place that detects and punishes crimes and let the expected punishment (fine) be: $F^e = PF$ or $F^e = P(C)F(C)$
- In the second case, the marginal expected fine increases with the level of crime (C) because the probability of punishment rises and the fine itself rises with the level of crime engaged in.
- [As an exercise, choose some numerical examples of probability and fine combinations that can generate an expected fine of $200.]

4. The figure below illustrates the geometry of criminal choices and has a number of interesting and clear implications.

   A. Among the implications are the following:
      - First, penalties matter. An increase in expected marginal penalties decreases crime.
      - Second, personal opportunity cost matters, a decrease in personal opportunity costs increases crime.
      - Third, other things being equal wealth persons engage in fewer crimes than poor people.
      - [Use a diagram similar to the above to demonstrate these points.]

   B. Note that the MC of crime may simply be a criminal's opportunity cost wage rate.
      - The lower that wage rate, the higher will be his crime rate.
      - It may also reflect "internalized" norms, so that the more "honest" or "rule following" a person is the higher his or her marginal opportunity cost for crime tends to be.
      - [Use the diagram to show that internalized norms of honesty or law-abiding behavior also tend to reduce crime rates (and explain the results)].



   C. Note that in rational choice models of crime, an increase in expected penalties always reduces crime. [Explain why.]

   D. A punishment's effect on an individual's choice depends on the size and nature of the penalty (cash or jail time), the probability that one will be caught and punished, and his or her degree of risk aversion.

      i. If the fine is "jail time" then a person with a high opportunity cost wage will face both a higher MC and a higher MC + F^E and so commit fewer crimes than a poorer person.

      ii. Time discount rates also matter if a punishment occurs well after the crime.
      - The expected present value of a fine of amount F in T years is $F^e = (P)\ (F)/(1+r)^T$
      - The higher the discount rate and higher T are, the lower is the expected present discounted value of the penalty. (Why?)

E. In the absence of fines or fees (F>0) for theft, trespass, murder, etc and in the absence of enforcement of (P > 0), self-interested agents will *choose whatever methods they which to minimize their production costs* and/or maximize their net benefits.
   - The results tend to be unproductive, poor, societies. (Remember the Hobbesian Dilemma.}
   - Many of today's poorest societies today are ones in which basic property and contract law are not well enforced (or in some cases well defined).

F. This does not mean that laws are perfectly enforced in prosperous societies, only that they are more systematically (and more honestly) enforced than in less prosperous societies.

5. In the real world, fines are imperfectly enforced, and potential law-breakers know this.
   - As noted above, the probability that the person or group will be caught, convicted and punished whenever he, she, or they violate the law also matters.

6. As far as economic models of human behavior are concerned, the law creates systems of "conditional rewards and punishment" that affect rates of return from different activities at the margin.

   A. It is through these incentive effects that laws influence behavior.

   B. The laws for example, specify under what conditions one might be punished (theft, trespass, contract breech, fraud, etc) and also the punishments associated with those actions.
      - From an economics point of view, it is the punishments that generate the behavioral effects rather than the laws themselves.
      - That is to say, law enforcement increases the marginal costs (marginal opportunity) cost for actions deemed illegal.

   C. In rational-choice based models **of crime there are tradeoffs between the probability that a law violator (criminal) will be caught and punished and the size of the punishment. $F^e = PF$**
      - The higher the probability of being caught and punished the smaller the fine (or other punishment) can be.
      - (Evidently the persons who drafted the code of Hammurabi believed that high "fine" (the death penalty) would be sufficient to discourage most crimes even if enforcement is imperfect. Would it? Doesn't it still depend on the expected benefits of crime and probability of being caught and punished?)
      -

7. Note that "criminal" activity in an economic model of crime simply means a law-violating choice.

   A. All sorts of peoples and organizations may violate laws when the expected MB exceed the expected MC over part of the range of interest.

   B. For example, it may be rational for firms to violate environmental laws, to cheat on their taxes, or break contracts.
      - In a setting with imperfect enforcement of the law, the firm's expected profits equal its (certain) Revenues less its (certain) Production Costs less its Expected Fines.

$$\Pi^e = R - C - F^e \qquad \text{where } F^e = PF$$

- Extra output normally increases revenues, so MR > 0.
- Extra output also normally increases costs, so MC > 0.
- Extra output also normally increases the probability that one will be detected and the fines that one will be subject to.

C. Similarly, "ordinary" individuals may drive faster than posted speed limits on highways, talking on cell phones, and so on..

D. For those who have had public finance or public economics, there is clearly a similarity between Pigovian taxes and efficient enforcement of an effluent mandate or standard.
- If a regulation is set to achieve Pareto efficiency, Q**, then the **smallest fine** sufficient to induce the target Q** has the **same** expected value as a **Pigovian tax** at Q**.
- [Draw a diagram with a Pigovian tax, then use a regulation and fine to obtain the same outcome. Note that the smallest expected fine sufficient to achieve this result is one that equals the Pigovian tax.]

VIII. The Optimal Expected Penalty and Level of Crime

1. We now switch from positive to normative analysis of criminal justice systems. We attempt to determine the social net benefit maximizing penalty and crime rate.
2. Detecting law violations, identifying law breakers, and punishing law violators are all costly activities.

   A. One needs, police, courts, jails, and an institutional structure that keeps them more or less honest.

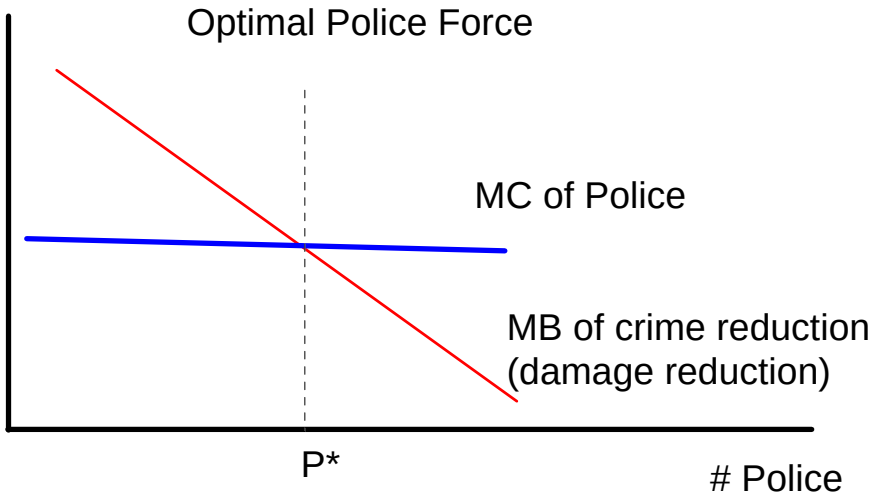
   B. In addition, there are other costs associated with law enforcement efforts, which might be regarded as externalities or mistakes, such as punishments imposed on the wrong persons, traffic accidents induced by pursuit, inconvenience for those wrongfully brought to court, unnecessary production of fear, and so on.

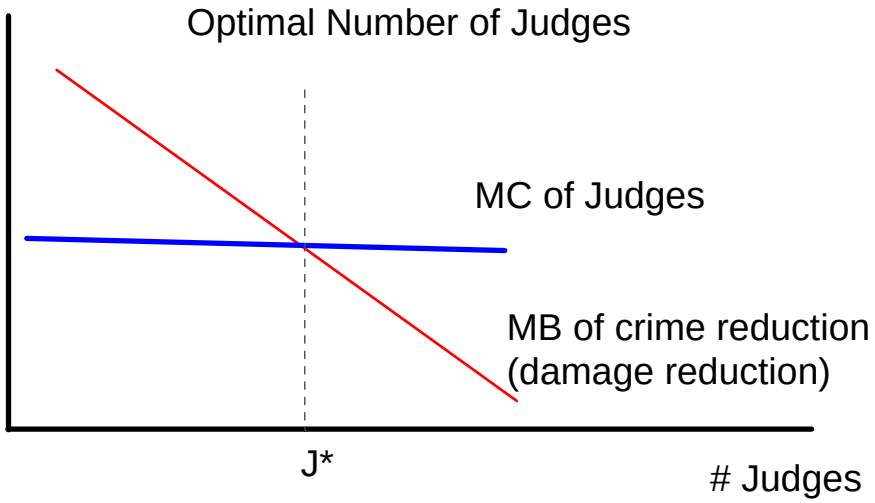
   C. The fact that criminal justice systems are costly to run implies that the optimal level of crime tends to be greater than zero.

3. Given what we have done so far, it makes sense to characterize an efficient criminal justice system and then determine the optimal level of crime.

   A. Similar diagrams can be used to characterize the optimal level of policemen (and related staff) and the optimal level of judges (and related staff).

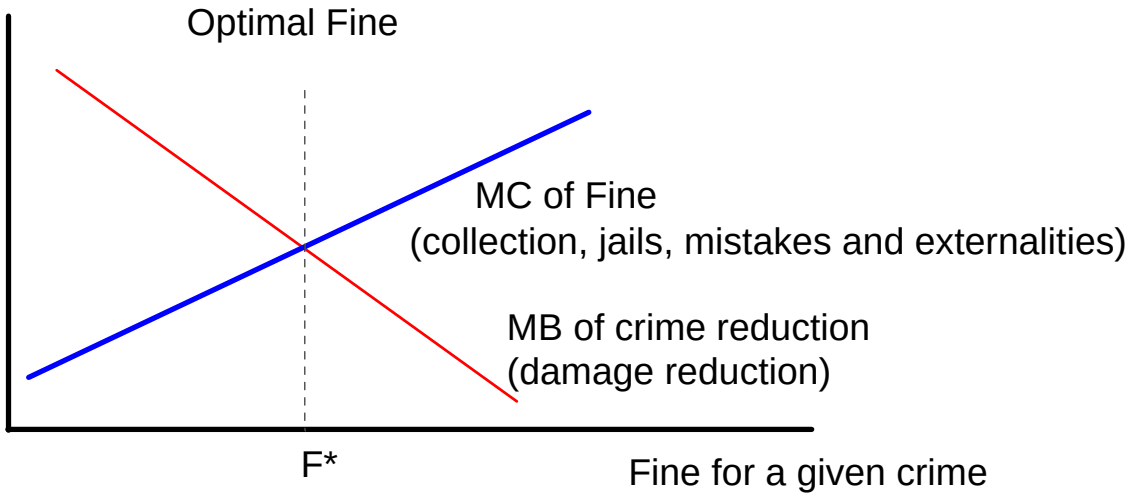
   B. The curves, however, all have somewhat different meanings.





C. These diagrams represent the marginal benefits of additional police and judges, which are the extent to which damages from crime are reduced through their effects on "P" the probability that a law-breaker will be punished (for a given penalty).
   - Notice that the optimal combination of police and judges varies with their wage rates (marginal costs) and with their effect on crime and damages associated with crime.
   - If wage rates rise, the optimal number of police officers and judges declines.
   - If their effect on P increases, their optimal numbers increase.

D. The optimal fine (or fine schedule [F = f(C)]) can be illustrated with a similar diagram. It also depends depends on their effect on criminals, but also their marginal costs to implement (including mistakes and externalities).



E. The above system of police, courts, and penalties will imply a particular crime rate through its effects on expected marginal fines.
- That crime level will be the **optimal level of crime**.
- Notice that the optimal crime rate is affected by a number of factors: the wage rates of judges and police, their effectiveness (effect on the probability of capture and conviction), the criminal's sensitivity to changes in those probabilities, and the damages associated with the crime.
- The optimal crime rate for a "low damage" crime tends to be higher than that for a "high damage crime," other things being equal, because all the above MB curves are lower.

4. Optimal Law Enforcement with Imperfect Policing and Courts.

A. The probability of being fined is partly determined by the probability of being caught, and also on the probability of being found guilty in a trial.

B. Because every criminal faces somewhat different circumstances, there is probably no expected punishments that is large enough to discourage all crimes.

C. And if tough punishments are more costly than weaker punishments (as jail time is more expensive than fines), then minimizing the magnitude of punishments makes administrative cost sense, even if error rates (punishment rates for the innocent) are low.

D. If trials are not perfectly accurate, as assumed above, then one has to include the probability that a guilty person is actually found guilty in a trial. In this case P is approximately the probability of being caught (affected by the number of police) time the probability of being convicted (affected by court resources).

E. All these factors suggest that the social net benefit maximizing level of crime is greater than zero.

F. (Note the **corruption** can undermine this enforcement system, and make property rights less valuable to those whose rights would no longer be protected by the courts.)

IX. The Effects of Political Institutions

1. Democracy
2. Representative Democracy with Minority Protections
3. Dictatorship
4. In between
5. Corruption
6. Central Bank Independence
7. Judicial Independence
8. Do democracies tend to increase economic freedom?

X. The Effects of Norms.

1. Trust
2. Honesty
3. Religion
4. Ideological Norms: Economic Freedom and Economic Liberalism