Some Determinants and Implications of the Costs

of Exercising Property Rights

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I. Introduction

Recently, the relationships between the exchange and enforcement of property rights and the allocation of resources have begun to be explored. The interface between Law and Economics has been expanded in the literature, with the result that institutional and legal constraints are increasingly being examined for their implications for welfare theorems and policy prescription. In particular, the relationship between externalities and property rights has gained attention by some writers, for example Alchian {1965} , Cheung {1969} , {1970} Coase {1960} , and Demsetz {1966} {1967}{1964}.

One result of this has been the increasing awareness of the importance of the costs of exchange (transactions costs) and the costs of enforcement (exclusion costs) of property rights. Transactions costs are now entering explicitly into many analyses, e.g. Millward {1970} Minassion{1964},as are exclusion costs. However, most of these models merely add these costs into the analysis in an exogenously determined "lump sum" fashion. While this is quite acceptable for short run analysis, in longer run analysis it is not. Once we explicitly recognise that the institutions and mechanisms in which resources and property rights are allocated are themselves costly, then we should expect the formation of these institutions to be affected by traditional economising behaviour. We must ask, then, not only how institutions affect behaviour but also how behaviour affects the institutions. Traditional economic theory cannot explain, for example, why the allocation of some activities is organised through a market, some in a firm, some by central authority or some on a first-come-first-served basis. Since each of the various institutions will have different implications for the costs of exchange and enforcement which in turn will affect the allocation of resources, what is called for is really a simulteneous solution to each of these "stages".

The present paper will not concern itself with this larger problem but rather, it will be primarily concerned with exploring some hypotheses regarding the determinants of the costs of exchange and enforcement particularly in externality cases. We will first briefly

examine the importance of these costs for externalities, then the
kinds of costs we are considering will be illustrated, then the
determinants of these costs and lastly the implications of these
costs for the bargaining solution.

II.   Externalities, the Costs of Exercising Property Rights and the Coase Theorem

The relationship between property rights, externalities
and the costs of exercising property rights has been explored else-
where, (see previous references, plus Moreland, "Property Rights
and the Pathology of Externalities", Warwick Economic Research
Paper, unpublished) so that in this paper we shall only briefly
review this aspect.   An external economic activity we define
as any activity by an individual (or party) A which affects,
positively or negatively, the welfare of another individual B and
for which no compensation is made (either to A or to B).   The
existence of external economic behaviour may be viewed more
explicitly as the conflicts of interest about the use of scarce
resources by utility maximising individuals.   Property rights,
as Alchian has pointed out {1961} , {1965}{1967} are a system that is
established to resolve such conflicts of interests or, as the
literature says, to "internalise" the external behaviour.   A
property right is the authorisation to engage in a certain activity,
usually associated with a particular (scarce) resource.   The
"purchase" of a good is viewed then as the purchase of a set of
property rights to various uses of the good.   The existence of other
people with other property rights to activities means that one is
limited to what one is able or "allowed" to do. De facto and de jure "rights"
may differ.

The concept of private property rights is characterised by
two elements: (a) the ability to exclude non-owners from engaging in
any of the uses (property rights) which the owner is said to run. This
condition creates the potential for gains from trading or transferring
rights to be had.   This ability will be limited by legal and technical

considerations (examined below) which will influence the costs of exclusion and hence the degree to which it is pursued. (b) Secondly, the ability to transfer the property rights will allow the realisation of the gains from trade. Property which cannot be sold, such as one's voting rights, is not private property. The transferability of private property will again be limited by the costs of such transfers and these costs will in turn be affected by legal and technological factors.

Whenever the costs of exclusion exceed the benefits derivable from such exclusion the activity in question may be consumed by other than the legally appointed owner. In the case where this involves a "nuisance" (e.g. smoke from a factory) one party's activities will impose an externality on another party. The affected party will gain from some alteration of the status quo. If the activity in question is a "good" (e.g. flower gardens) an externality is still present and the affected party will most likely gain by some alteration in the status quo e.g. in changing one or more of the activity's characteristics.

Coase demonstrated in a now classic paper {1960} , that in the absence of information and transactions costs the legal liability for blame (or allocation of property rights) is irrelevant with respect to the final allocation of resources and that the final allocation of resources will be Pareto optimal. Turvey {1963} and Buchanan and Stubblebine {1972} have also argued this point.

A brief review of this result may be helpful. The theorem implies ethical neutrality of the assignment of "blame" (in the absence of clearly defined prior rights) which some authors, notably Mishan (C.F. Mishan {1971}) seem unwilling to accept: if A inflicts "harm", as a consequence of some activity, on B and B is not compensated, B is clearly worse off. But if B is compensated by A, then A is clearly worse off. That is, B has inflicted "harm" on A.

Suppose A engages in an activity which brings him marginal net (private) benefits according to the MB_A schedule in Figure I and which inflicts marginal net costs which accrue to B according to the schedule MC_B. If A is granted the right to the activity, then A

gains and B looses; if A is not allowed to engage in the activity, B benefits and A suffers. In the absence of adjustment costs, whoever is deemed liable for the activity, the efficient level of the activity will be Q*. If B must bear the costs, he will offer to pay A to stop. In the absence of B's offers, A will engage in Q_1 of the activity Q. B's offer will depend upon the magnitude of A's activities and will be determined by the MC_B schedule (which we assume is known since information is costless). A's decision regarding accepting payment or continuing or increasing Q will be determined by where on his MB_A curve he is or can be. Since for A to ignore a bribe is to incur a cost - he has sacrificed a foregone alternative - the marginal cost of engaging in a certain level of activity is the bribe he has passed up of curtailing the activity by one unit at that level. When $MC_B > MB_A$, A will accept the bribe so the activity will not go beyond Q* where $MC_B = MB_A$.

If the liability rule is reversed, equilibrium will rest at the same amount of Q. In this case the starting point for negotiation is the origin and A must make payments to B for incremental damages incurred. The bribery process will continue as long as $MB_A > MC_B$ and will stop where $MC_B = MB_A$.

Since this example involves one of bilateral monopoly the distribution of the rents of area 1 or 4 (depending on the status quo point) between A and B cannot be predicted a priori. The size of the bribe which each party offers is not known since the minimum each will accept when they have the property rights to Q is less than the maximum each will offer (when liable) in the bargaining range.

Figure 1
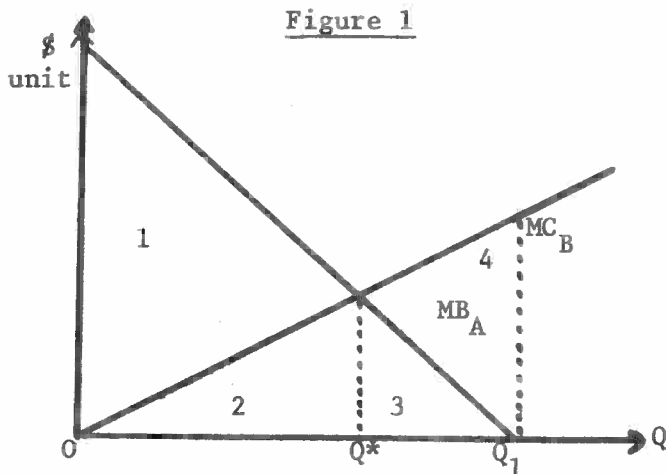
Furthermore, the theorem must be qualified by recognising
that if welfare effects are operative - i.e. that the position
or slope of the marginal curves is affected by the amount of
income one has - then the status quo will matter.   This has been
discussed by Mishan {1968} and Dolbear {1967}{1968}.   Furthermore,
the size of the bribes offered and accepted will shift the curves
and hence the final equilibrium, if such welfare effects are operative.

The importance of the Coase Theorem lies not so much in showing
that liability doesn't matter, but that there is nothing inherent
about "spillovers" or "interdependencies" which a market or bargaining
cannot handle.   Yet the existence of externalities are a form of
market _failure_.   While the Coase Theorem is interesting, its
assumption of zero exchange and policing costs limits its applicability
to a class of phenomena which by definition will not be involved in
externalities.   This is because, as we have noted, the basic cause of
an externality is the existence of such costs.

The presence of exchange and enforcement costs does not imply
an all-or-nothing situation of a "market" or "no market".   It merely
means that these costs will be instrumental in determining the outcome
of a conflict of interests and hence the allocation of resources.

III.   Kinds of Enforcement and Transacting Costs

Before considering the possible determinants of these costs
a brief discussion of the kinds of costs that may arise in the
exercise of property rights seems warranted.   The various costs
listed below are by no means mutually exclusive as regards their
classification into enforcement or transactions costs.

1.   Information Costs

The concept of information costs is well known and does not
need to be extensively treated.   However, a few points can be made.
Firstly, both parties to the conflict will incur information costs,
although some recouperation of these may result from the outcome of
bargaining, litigation etc.   A substantial part of the information

costs is likely to be incurred in <u>measuring</u> the extent of damages or
benefits incurred and the extent of property rights which have been
violated or are potentially to be traded.   One writer goes so far as
to equate all transactions costs with measurement costs. (C.F.
McManus "The Organisation of Production", Carleton Economic Papers
(unpublished)).   Not only must these activities (and their effects)
be measured, but they must also be measured to the mutual satisfaction
of the parties involved.

In externality cases such costs may be significant. They
will affect not only enforcement (what rights have been violated and
by how much ?) but also transactions and trading (how much is one
trading or willing to trade ?).   Technology can certainly influence
these costs.   For example, surveillance provides continual information
on whether property rights are being violated; recent technological
innovations which have reduced such information costs include hidden
T.V. cameras and still cameras, tape recorders, computerized book-
keeping procedures etc.   In Meade's well known apple-grower and bee-
keeper example information regarding the amount of benefits bestowed
upon the bee keeper by the apple grower (and vice-versa) may require
the development of the science of apple-bee interaction at a
considerable cost.[1]   A merger solution
would offer no magic "internalizing" of the externality scince the
measurement costs would exist for whoever owned the orchard and bees.

The costs of information and particularly the measurement
aspect are similar to what Demsetz ({1966,}p. 64-5) has called
"valuation costs".   These are essentially information costs concerning
the determination of the values of costs and benefits incurred.

2.   Organisation Costs

Often several people may jointly possess (or share) the
same property rights (as is usually the case with public ownership) or
each may possess some portion of the rights to use the goods in question.
We shall discuss the implications of such arrangements in more detail
later.

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[1] Demsetz, {1969} p. 15-16.

If the property rights of the several owners in question are violated they will have to organise themselves in order to take action in enforcing their rights. Communications among them, meetings, secretarial work, individual time and effort all will have to take place and <u>all at a cost</u>.

Another case in which organisation costs are involved occurs where several owner's individual property rights have been violated by one or a group of parties. For example, if people have the property rights to clean air and a factory pollutes the near-by air, landowners will want to enforce their rights - they may, then, wish to organise[1] and sue the factory for damages incurred. Again, this organisational activity is costly.

3.   Transactions Costs

In addition to the costs of discovering if in fact one's rights were violated, with whom one has to deal and possibly any organisation costs, there are costs involved in arriving at and transacting the actual bargain that is made between the parties involved. This does not refer to the cost of the bargain or the resources that may be exchanged in the bargain. It is the cost of engaging in the exchange. The most commonly quoted example includes court costs, lawyer's fees, negotiating costs leading up to a bargain and drawing up a contract, as well as the value of time spent in the transaction.

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[1]   The decision to organise is an economic decision depending on the cost and benefits to each individual of stopping the pollution. We shall return to this, as well as the implications of all this section, later on. For a complete discussion, see Buchanan and Tullock, <u>The Calculus of Consent</u>, Ann Arbor: University of Michigan, 1962, Chapters 5 - 8.

4. Realignment Costs

Closely related to the concept of transactions costs is
what Demsetz has termed realignment costs. (Demsetz {1966} , pp.
65-67). These are essentially transactions costs incurred in the
initial assignment of property rights or in the re-assignment of
rights. When an externality is new and rights with regard to the
externality are ambiguous (not pure), then some negotiation and
possible exchange will occur in the assignment (or clarification)
of who has the property rights to engage in the external activity.
Realignment of property rights may occur regarding old externalities
if some exogenous change like a technological advance or shift in
demand affects one of the parties involved. Once again, these
assignment and realignment activities are not free.

IV.   Determinants of Enforcement and Transaction Costs

We turn now to the task of identifying the factors which may
affect the costs of negotiating and/or enforcing one's property
rights. Very little theoretical and/or empirical work has been done
regarding the nature and determinants of the kind of costs currently
under discussion, so this section will consist largely of "new" hypotheses
together with those of other authors. For the moment, we shall lump
all of the kinds of costs discussed in the last section into one and
call these costs "the costs of exercising one's property rights".
We shall identify three main factors which are more or less
quantifiable - number of participants, extent of the activity,
divergence of the conflict before settlement - and four main factors
which are less tangible but nevertheless will affect the costs of
exercising property rights.

Of course in any given situation there will always be a
number of ad hoc factors influencing the costs of transacting or
enforcement. Perhaps it is because of these that so little has
been done in this area. However, our task as economists is to try
and isolate out those general factors which may influence a broad
spectrum of cases.

1.   Number of Participants

        The costs of exercise, will vary directly with the number of
people affected whether they are "losers" or "gainers" from an
extension of some activity.   Such costs will arise from the organisation
of each "side", dispersion of information among each group, negotiation
among the group with regard to reaching an agreement in respect to
compensation offered or received by each member in the group.   Such
costs will also rise with the geographical dispersion of the group,
as the costs of communication are usually greater, the greater the
distance.[1]   Mishan suggests that "although no reliable studies
have been made in this connection, it seems likely that the costs
both of collecting information and reaching agreement ...... will
rise exponentially with the magnitude of n"[2]   (the number of
participants).   So, it is suggested, not only do the total costs
of exercise rise with the number of particpants.   Indeed, any
activity among a given interest group[3] which requires individual
participation will be affected and hence the costs of that activity.[4]

2.   Extent of the Activity

        The extent of the activity in question, either at the status
quo or some alternative level, may affect in many cases the costs of
enforcement and the costs of drawing up a contract (i.e. initial
distribution or redistribution of property rights).As an example of the
affects on the costs of enforcement, consider the cattleman - farmer conflict
used by Coase {1960} where cattle wander onto neighbouring farm land and
damage crops.   If the length of the border of the two properties is short,

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[1] The total cost is usually greater although the average cost of
     communication with respect to distance may decline or remain constant.
     A first class stamp will mail a letter from New York to New Haven or
     Boston in the same amount of time. Mishan includes the distance between
     the participants as a separate variable. c.f. Mishan {1967} p. 268.

[2] Ibid, p. 268.

[3] This term may be ambiguous, as we shall see later on.

[4] Even a group meeting for negotiations requires individual attendance
     or proxy.

then the cost of a fence or of patrolling along such a border may
be quite low. But if the length of the border is long, the
cost of a fence will increase and in general will be at least
proportional to the length of that fence.[1] If, alternatively,
the size of the cattleman's herd is increased from a small one to
a larger one, this will increase the probability that the fence will
be broken down by the hungry cattle so that a stronger fence must be
erected. If the enforcement device is a patrolling cowboy or farmer
who herds the cattle back where they belong, an increase in the
number of cattle may require an increase in the number of people on
patrol if the same level of protection is to be maintained. How
the marginal cost of enforcement with respect to the level of
activity will behave will depend on whether we experience increasing
or decreasing returns to enforcement. And this will depend on the
level of enforcement <u>relative to the amount of the border to be</u>
<u>patrolled</u>. Thus, one man with fifty miles of border to patrol will
not stop as many trespassing cows as he would if he only had twenty-
five-miles to patrol. Alternatively, two men patrolling fifty miles,
provided they "split up" the patrolling, i.e. don't patrol in pairs,
will be more effective in terms of number of trespassers prevented per
man than one man. And a man with only twelve miles to patrol may
be able to stop even more cows; or four men will be more effective
than one man in patrolling a fifty mile border.

It is also possible that the extent of the activity will affect
the costs of realignment or the costs of transferring the rights of the
activity from one interest group to another. This will be particularly
true if the information costs regarding the activity or resource are
proportional to the extent of the activity. For example, if the
farmer's land consists of one hundred acres divided into one hundred
plots, each with its own deed or title, and border, then before the
sale of that one hundred acres, each title must be searched and each
plot perhaps surveyed. In many cases, though, the average cost of the
transaction may decline as the "size" of the transaction increases.
Thus, assuming that there are pure rights to be transferred (no

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[1] If we include possible second order effects, such as a possible increase
in the price of fencing, due to this increased demand, the cost is
greater still. Normally, we shall stay with a partial analysis and
ignore such possibilities.

information costs such as those just discussed) it seems likely
that the cost of drawing up a contract for, say, one hundred acres
would not be twice the cost of drawing up a contract for, say
fifty acres.

A major component of the cost of transferring many
resources from one owner to another is transport costs. Such
costs moreover are almost always proportional to the size of the
transfer (amount of the resource moved as measured by weight or
volume), although economies of scale may be involved. However,
transport costs as such are of little importance for transferring
goods involved in an externality, since such goods are almost always
spatially fixed. Thus air, land, light rays in a given area, space,
and bodies of water - all examples of resources that may enter
externalities - are fixed spatially so that any transfer of rights
to their use would not imply transfer of their spatial positions.

3.   Divergence of Conflict

In this paper we are not concerned explicitly with the kind
of bargaining process which will be used. There are numberous theories
of the bargaining process, c.f. Coddington {1968}, particularly for
bilateral monopoly, and a priori, it is difficult to specify anything
other than some general characteristics which the bargaining will take.

It is interesting to note that almost none of the theories
outlined by Coddington explicitly allow for bargaining costs. One of
the characteristics of the bargaining process is the dynamic adjustment
and the sequential negotiating sequence. We make the implicit assumption
below that the larger the "divergence" of conflict, the "longer" the
negotiating sequence. "Longer" here, may refer to the times it takes
to reach a settlement or to the number of iterations or both. Casual
observations of, for example industrial disputes, would suggest that
the greater the initial discrepancy in a dispute, the "more difficult"
a settlement will be.

Our third hypothesised factor operative in determining the cost
of an agreement between the conflicting parties then is the "divergence

of the conflict" at the status quo.   There are two elements of
this divergence.   Firstly, there is the divergence which is
related to the difference between the status quo point and the
equilibrium following bargaining.   Supposing the conflicting
parties to be A and B with B liable (status quo favours A), then
B can offer A an all-or-nothing bribe, but such a bribe would
involved some knowledge of A's marginal benefit (or loss) curve
from the activity in question if B hopes to make a successful
offer;   such knowledge may not be available.   Alternatively, B
may make incremental bribes, as described earlier.   The limit on
the number of such bribes would be related to the divergence between
A   and   B as measured by the difference between the starting point
and the equilibrium which the liable party, in the absence of the
offending party would choose.   Since the status quo is likely to
be the equilibrium chosen by the "offending" party without regard
to the other party, the limit is simply set by the two "independent
equilibrium" solution points.   Such a limit may, in B's absence of
information on A's marginal evaluation curve, form the basis for his
(B's) ex ante estimate of the divergence particularly if he adopts
a strategy of expecting the "worst".   Since each bribe involves
information, communication, and transactions costs, the size of the
expected divergency will affect the ex ante bargaining costs. Since
B will rarely be able to bribe A all the way back to his (B's) own
independent equilibrium, his ex ante estimates of the costs of making
bribes (not including the actual bribe payment) may be over estimated
and lead him to making a decision not to bribe when in fact it may
have paid ex post to do so.   We examine the implications in more
detail later on.

While the divergence between independent equilibrium will
form the limit to the bargaining range, the slopes and estimated
slopes of the marginal gain and loss curves will determine more
accurately the divergence between the status quo and the bargaining
equilibrium.   We may reasonably assume that each participant has
knowledge of his own marginal evaluation curve[1]   and in particular

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[1]   We shall use interchangably the terms marginal evaluation and marginal
       gain/loss curves, even though their technical definition may be,
       strictly speaking, different.

the slope of that curve. Each party will also have to make some estimate of his opponents' curve. This estimate of the oppositions' curve together with knowledge of his own curve will affect his ex ante estimates of where the equilibrium of any bargaining process will reside and hence his estimate of the costs of that process. Estimates of the costs of negotiating will thus be affected by estimates of the opponents' marginal evaluation curves, and since each participants' estimates of the other will differ, their measures of the divergence will differ.

Consider Figure 2 in which all curves are estimated by B. If B's MC curve is known by him to be MC_{B1} and he estimates A's to be MB_{A1}, then B's estimates of the final equilibrium will be in the neighbourhood of Q_{11} and his estimate of the divergence of conflict with respect to the final equilibrium is $Q_{11} - Q^s$, where Q^s is the starting point (either Q_1^s, or Q_o^s). However, if B estimates A's curves as MB_{A2} then his estimate of the divergence is $Q_{12} - Q^s$, So if the starting point is, say, Q_o^s (i.e. B is liable) then B's second estimate of the divergence is smaller than the first. To the extent that the costs of bribes are an increasing function of the divergence (i.e. number of bribes that must be made) between the starting point and the expected equilibrium, the ex ante estimates of the costs in the second case will be lower than in the first case.

Supposing Figure 2 now to depict A's estimates of the curves, similar analysis from A's point of view with respect to various estimates of B's curves will show estimate of the divergence as $Q_{11} - Q^s$ and $Q_{21} - Q^s$, if MB_{A1} is A's true curve. Alternatively, $Q_{12} - Q^s$ and $Q_{22} - Q^s$ would obtain if MB_{A2} were relevant. But it should be clear in all of these cases that there is no reason for us to expect that A's estimates of B (or B's estimates of A) will be accurate.

So, in the absence of perfect information, the process of bribery and negotiating is a way of actually defining where the marginal evaluation curves lie. And the further the two parties must travel along these, the more costly the process of reaching an agreement.

A second element of the divergence is the amount of rents to be distributed among the conflicting parties. Reconsider Figure 1 and ignore income effects. We saw earlier that if Q_1 is the starting point the distribution of the rents of area 4 will be contested and if O is the starting point, the distribution of the rents of area 1 will be contested by A and B even though the final equilibrium will be Q*. Now this distribution will matter to the parties involved since the larger the area to be divided, the larger the opportunity cost of not acquiring the whole of the area. Hence, bargaining for a large area will most likely take more time which is costlier, involve more dramatic bargaining tactics and threats, and hence more cost, than for a smaller area. In less precise language one might say that when area 1 or 4 is small, reaching an agreement will be relatively easier than when either of these areas is larger.

4. <u>Environmental Limitations or Restrictions</u>[1]

We have just examined the way in which we might expect transactions, information and enforcement costs to vary with variables that will appear in externalities cases. Normally, we would expect very little "interaction" between these variables regarding their effect on the costs of exercising property rights[2]. That is to say, that an increase in the number of participants, while having an effect on the marginal cost of bargaining with respect to the number of participants, would have little or not effect on the marginal cost of bargaining with respect to say, divergence of conflict. The cost function of property rights exercise is thus regarded as separable. We may write then:

$$C = C(n, e, d)$$

where

$$C_n = f_1(n) \geqslant 0$$

$$C_e = f_2(e) \geqslant 0$$

$$C_d = f_3(d) \geqslant 0$$

and C is cost of exercise, n is number of participants, e is extent of the activity and d is divergence of conflict.

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[1] Some of the inspiration for this section was gained from discussion with V.L. Broussalian and from an unpublished paper of his, "Non-Marketability and Public Expenditure Theory" Duke University, 1970,
[2] Here we include all costs, enforcement, information, negotiations.

Figure 2
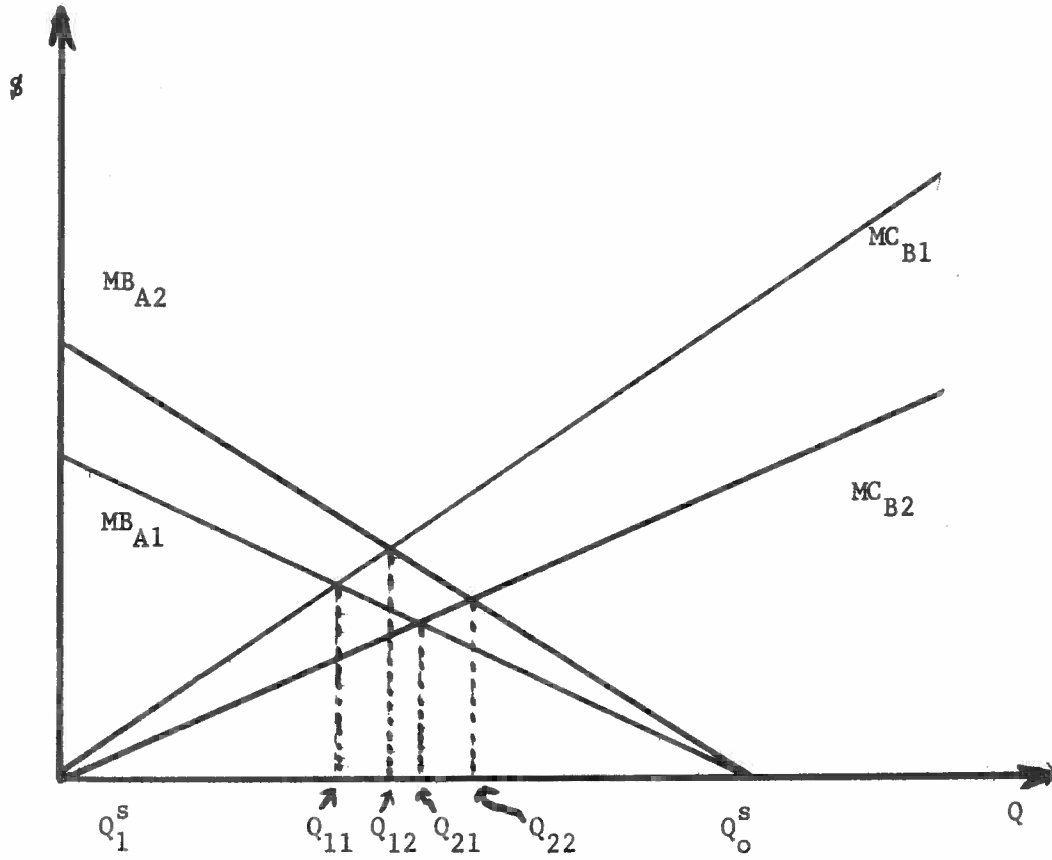
Property rights, however, are ordinarily subject to a variety of limitations or restrictions. Such restrictions involve (a) those resulting from legal considerations; (b) technological considerations; (c) those resulting from the social and political institutions. These limitations will have the effect of increasing the costs of bargaining. But as they form the underlying environment in which the various factors discussed above operate, they are likely to effect the marginal as well as the total costs of bargaining with respect to n, e and d, although not, perhaps, in always the same magnitude or direction. Let us discuss these restrictions at length.

(a)   Legal Limitations

There are several legal limitations which may be operative and affect the cost of exercising property rights. Firstly, there may be no existing legal rights with respect to the costs and benefits derived from the activity in question. That is to say, the legal system may not have, as yet, ruled on the rights of individuals with respect to the use of certain types of property; ownership is not defined. The reason for this neglect is often quite simple: it has not been previously "worth it" to define a set of rights: the costs have exceeded the benefits. But continuous change in knowledge and tastes results in new production functions and market values for types of activities. The "emergence of new property rights takes place in response to the desires of the interacting persons for adjustment to new benefit-cost possibilities[1] which result from changes in economic values stemming from the development of new technology (see discussion below) and the opening of new markets.

A priori, we cannot assert that all new conflicts of interest that arise will be settled via some legal definition of private property rights, since such a system is but one of many alternative forms of ownership that may arise. In this regard, a community's preferences for private ownership must be considered before we can say anything conclusive.

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[1] Demsetz "Toward a Theory of Property Rights", American Economic Review, May, 1967, p. 350.

An historical example in this regard is given by Demsetz[1] of Quebec
Indians who evolved a system of private hunting rights in response
to the "overhunting" of their lands resulting from the introduction
of the fur trade.   In contrast, no such rights evolved among Indians
of the south western plains in North America where there were no
plains animals of commercial significance comparable to the fur-bearing
animals of the forest, so that no externality arose[2].   Some
contemporary examples of undefined rights are the use of the ocean
beds, the use of the upper stratosphere and, indeed, the lower
atmosphere, the level of sound one is subjected to, the use of
university facilities (who "owns" a university?), and the use of one's
beach property without having it soiled by oil spills originating from
someone's property beyond territorial waters.

In most of these cases, the absence of a clear definition of
rights has the effect of ownership by many people.   In such cases,
the state is unlikely to assume the duty of enforcing private property
rights, since such rights do not exist.   To the extent that economies
of scale exist and returns to specialisation in enforcement are earned
in police services, a private individual will face larger "enforcement"[3]
costs than if the title were clear.   Alternatively, the injured party
may seek a court ruling on the definition of rights but if the case is
without precedence the ruling may be quite costly.   Also the establish-
ment of a legal precedence gives rise to a "free-rider" problem since
the party or parties seeking a court ruling (or legislative ruling)
will reduce the costs of exercise for subsequent litigants.

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[1] Ibid, p. 350 - 353

[2] At least none arose with respect to the hunting of game. But one
explanation of the "Indian Wars" of the nineteenth century is the
conflict of interests between the natives of the plains and the
white settlers with respect to land and resources used there.   In
these cases, the settlement was usually reached after competition
in the form of violence, after which Indian "property" in the form
of reservations was established.

[3] Without a legally binding title, ownership can only be defined and
enforced between parties according to private agreements.

A second limitation that stems from legal considerations
is ambiguities in the title as to who is ultimately entitled to
what.   This is simply a less extensive case of the one just
discussed.   Ownership may now be defined with respect to a certain
resource and even to the use of that resource in question, but the
specific level of benefits one is entitled to or costs one is
responsible for may not be clear.   For example, the law is replete
with reference to vague terms like "reasonable" or "fair" levels of
this or that.   Until such ambiguities are clarified, uncertainties
in the expectations of prospective owners of the property will exist
with the result that the cost of using that property is increased since
a risk discount factor must be at least implicitly incorporated into
decisions.   The result is that the market value of the property will
be reduced.   The costs pertaining to the establishment of rights and
the enforcement of such rights in the absence of legal definition of
ownership which we have already discussed apply here as well.

Legal restrictions also exist regarding the use of various
measures to exclude non-owners or trespassers.   For example, the
use of spring guns is limited in the U.S.. Posner, in a recent paper
{1971} , has analysed the American courts' behaviour regarding decisions
to recognise a privilege to kill or wound to protect a property interest.
He concludes that the courts have followed broadly a pattern which is
consistent with a rule of liability based on economic considerations:
"a rule of liability that will maximize the value of the affected
activities, subject to the constraint that any rule chosen be simple
enough to be understood by those subject to the rules and to be applied
by courts (our administrative cost point)".[1]
Only under certain circumstances is killing or wounding permitted:

> Thus, the courts have refused to sanction the use
> of deadly force to repel merely technical trespasses
> that cause no loss or damage, as when a property owner
> shoots a hole in a boat that has strayed into the
> owner's part of the lake; and they have rejected any
> privilege to use deadly force in support of a legal
> claim asserted in a boundary or other property dispute.[2]

Other examples of legal restrictions on exclusion methods
undoubtedly exist, however it is only our purpose here to note their
existence.

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[1]Posner {1971} p. 214   [2] Ibid., p. 216

Finally, explicit legal restraints may be imposed on transfer of property rights, their use and on the negotiability of rights which have been "settled" in the courts. Stolen property can neither be resold or used legally. Many kinds of drugs which can be legally purchased with a prescription, cannot be subsequently resold. Home made liquor ("home brew" and "moon shine") can be legally made and consumed but not sold. Land is usually zoned for specific purposes so that certain uses are forbidden by law.

The negotiability of rights (ability to transfer certain rights) from the standpoint of legal protection is often questionable. The analysis up until now has assumed that the law will permit the settlement of rights in the court to be a starting point from which rights may be redistributed through some kind of private negotiation. Burrows {1970}, who has examined the British laws in this regard, points out that this may not be a realistic assumption in many cases[1]. The legal practice in these respects differs in the small and large number (of participants) cases. Out-of-court bargains are common in the case of small numbers dealt with in the civil courts. However, it is questionable whether injunctions, once imposed by the courts, are negotiable:

> The court may lift an injunction at the request of the offended party but would be unlikely to reimpose it at a later date in the event of a default in payment of privately agreed compensation. Alternatively, the offended party may refrain, in exchange for compensation, from committing the offender for contempt of court when the conditions of the injunction are not fulfilled; but it may be doubted whether the defendant would be prepared to enter into a bargain enforced by the threat of imprisonment for contempt in the event of his default in payment. If judicial decisions in favour of the offended party are automatically supported by non-negotiable injunctions the economists' analysis of conditions for a market solution is irrelevant in cases where rights cannot be agreed upon without a court decision.[2]

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[1] Burrows {1970} , pp 46-47

[2] Ibid. p. 46.

Negotiation is certainly prohibited in cases where the externality is brought to a criminal court and a settlement in favour of the offended party is reached. "Public nuisance" is treated in Britain as a crime and as such no opportunity for subsequent out-of-court bargains or negotiations to redistribute rights is allowed. In cases involving a large number of participants[1], the civil courts can only be used "by offended parties who can show losses substantially in excess of those incurred by the rest of the group"[2]. Such limitations on the transfer of rights cannot enhance and most surely will lower the market value of the affected property. At any rate, the courts' decision cannot be always assumed as a status quo point for bargains. We shall explore the implication shortly.

(b)   Technological Limitations

The absence of legal restrictions is not a sufficient condition for the unconstrained exercise of property rights. Particularly with regard to the ability to exclude non-owners, technological reasons may be quite relevant in defining the costs of surveillance, physical exclusion, and transactions. For example, the recent development of scrambling and unscrambling devices for television signals has meant that T.V. can now qualify as private property since it is now possible to exclude people from viewing programmes. The development of closed circuit television, laser beams, two-way mirrors, infra-red cameras, radar, sonar and various other "spying" mechanisations means that the costs of surveillance may have been lowered where these devices can be used. The branding of cattle permits the exercise of private property rights over it when it is grazing in a common pasture (because the costs of identification are lowered), but "the inability to do something similar to fish in a lake is a serious impediment to the exercise of private property rights over it"[3].

The use of automatic exact change toll booths on highways, bridges and parking lots and of automatic turnstiles operated by inserting special tickets obtained from vending machines in the London Underground System are both examples of technological innovations which

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[1] It is not clear what constitutes "large".
[2] Ibid. 46-47.
[3] Broussalian, op.cit. p. 7.

have reduced the costs of excluding non-owners. Similarly the use
of tokens on the New York subways and buses and "exact fares" systems
in cabs and buses provide an interesting example of "double exclusion"
problems. In crime ridden cities, not only does one desire an
exclusion mechanism (via price) to keep "non-owners" off the bus, but
one also needs a mechanism to exclude people from stealing the proceeds
of the mechanism (exact fares or tokens).

Technology can also affect the costs of making transactions.
The examples given above for exclusion devices could have been equally
included as relevant to transactions costs. Indeed, they point out
the often dubious distinction between exclusion and transactions
activities. Since communication between parties to a transaction
is usual, anything which reduces the costs of this, particularly the
time element, will reduce the cost. For example, recent develop-
ments in telecommunications such as multiparty telephone conversations,
video-phones, automatic long distance calls, and "telex" all reduce
transactions costs. The computer has provided a wide range of cost
reductions, particularly with regard to billing and bank accounts.

(c)   Institutional Limitations

The creation of institutions, such as exchanges, either by
the government or private entrepreneurs will be influenced by social
and political attitudes towards various kinds of private property
rights. In the extreme case of Marxism, no private property rights
are recognised by the government, so that no attendant institutions
would develop. To the extent that such institutions do not develop
exchange and exclusion costs will be high. Even where an institution
does exist, there may be a cheaper method available of attaining the
same end.

The evolution of new forms of private property and, indeed,
the initial evolution of "institutionalised" private property will
serve to reduce costs associated with the use of property.[1]

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[1] It may seem odd to talk about the costs of exercising private property

rights when no such rights exist.   A resource or activity
qualified in this analysis for the label "private property"
when it assumes the attributes of exclusivity and trans-
ferability.   By "institutionalised" private property, however,
we mean that the property's private attributes are in some sense
legitamised by the courts or government of the relevant society.
Thus a resource may conform to the definition of private property
as previously defined, but still not be institutionalised.
Institutionalised private property serves to lower the costs of
exercising rights since it usually involves the evolution of
attendant institutions as previously discussed.

The example, already given, which Demsetz cites regarding the evolution of private property among North American Indians, is relevant here. "Condominium" is a recent innovation in the U.S. in the form of private property contracts. Cheung {1969} has explored the costs and implications of using three forms of contracts in agricultural labour. These include the fixed-rent contract where rent per acre for the labourer is stated in cash or crop, a share contract where the worker gets a certain pre-determined share of the final harvest, and a wage contract when the labourer receives a stipulated wage regardless of the yield. Each of these arrangements has different negotiation and enforcement costs which will influence firstly the type of contract chosen and secondly the allocation of resources between crop producing and contract exercising activity:

> Contracting on a share basis appears to involve higher transactions costs as a whole (the sum of negotiation and enforcement costs) than a fixed-rent or wage contract. The terms in a shares contract, among other things, includes the rental percentage, the ratio of non-land input to land, and the types of crops to be grown. These are mutually decided by the landowners and the tenant. For fixed-rent and wages contracts, however, given the market prices, one party alone is sufficient to decide how much of the other party's resources he shall employ and what crops shall be grown. And since in a share contract the sharing of output is based on the _actual_ yield, efforts must be made by the landowner to ascertain the harvest yield. Thus negotiation and enforcement are more complex for a share contract than for a fixed-rent or a wage contract.[1]

Of course the structure of a contract may influence the rewards of using a resource, so that the least costly contract may well not be chosen, but such a consideration does not concern us here.

V. Some Implications of the Costs of Exercising Property Rights

In Section II we argued via the Coase Theorem that the court's decision on legal rights with respect to a disputed resource would in principle have little effect on the final distribution of these rights. But this conclusion, as Coase was well aware, assumed a

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[1] Cheung {1969} pp. 25-26

costless market[1] and it is clear that once such costs are taken
into account a subsequent re-aligment of rights will only be
undertaken when the increase in the value of production resulting
from the re-arrangement is greater than the costs which would be
involved in bringing it about. When this increase is less, the
court's decision may result in an activity being discontinued
which would have been undertaken were the market costs less so that
in such cases the court can influence the final allocation of resources.
Such a conclusion is hardly surprising since all it says is that costs
matter.

But what is more interesting is that alternative decisions
by the legal system may, because they affect the starting point for
potential negotiations, also affect the costs of such negotiations
and hence the feasibility or final outcome of such negotiations. If
the costs of bargaining are independent of the level of activity Q
in Figure 3. and are not affected by "divergence of conflict" factors
- i.e. are lump sum - then the courts' decision may matter. Consider
three cases.   In the first case, the costs of settlement exceed the
value of area 4 (which is larger than area 1).   In such an event, if
the liability rule favours A (starting point Q_1) or B (starting point
0) the status quo will be maintained since any gains would be erased by
the costs of moving to and maintaining Q (for A).   In the second case,
the court's decision on who is liable will not, ceteris paribus, affect
the final outcome of the equilibrium value (Q*) since in both cases the
gains from moving to Q* are more than the costs of going there. In the
intermediate case where the lump sum costs of moving to Q* are greater
than area 1 but less than area 4, the courts decision will matter only
if it rules in favour of B.   If A is favoured by the court, gain
from trade net of negotiation and maintenance (of equilibrium) costs
will exist so that Q* will be attained.   These cases are straight-
forward and fall in the category of cases discussed by Coase.

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[1] Coase briefly examines some implications of the cost of the market
   in section VI op.cit., 1960. We have since seen that even this
   conclusion is not quite right.

A. Divergence of Conflict Factors

In cases where divergence of conflict factors are operative, the implications of alternative liability rules is less clear. If the courts decision on liability (say B is liable) results in a starting point that is relatively (to an alternative liability rule) "far away" from an equilibrium that may, in the absence of bargaining costs, be reached, then the costs of travelling to that equilibrium may outweigh the gains of moving to it. If the court alternatively decides that A is liable such a decision may mean that the starting point for any decision is relatively nearer the potential equilibrium so that the divergence of conflict is less and negotiating costs are less. And this is true even when bargaining costs are constant with respect to the activity in question and symmetrical between interest groups.[1]

In Figure 3. if the starting point is Q_1 with B liable then whenever the total costs of negotiating for either party exceed the value of area 4, Q_1 will remain the status quo. However, if the starting point were 0 then area 1 is the relevant gains to the economy of moving to Q* and the costs of moving to Q* from 0 through negotiation would have to be compared with these gains. Now the total costs of moving from Q_1 to Q* are likely to be greater than the total costs of moving from 0 to Q*, but since (as we have drawn this case)/the gains of the first movement are also greater than those

<u>area 4 is greater than area 1</u>

from the second. So that whether the liability rule will affect the outcome will be determined not only by the costs of negotiating from a given starting point but also those costs relative to the total gains to be had from the starting point. In general we can not say how these benefits will behave with respect to the divergence of conflict, particularly when non-linearities in the marginal evaluation curves enter, so that in general we can not say how a court decision from the stand point of divergence of conflict will affect the probability of settlement via negotiation.

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[1] Contrast this with Burrows who writes, "The availability of net community gains to bargains can be dependent on the settlement of rights only if bargaining costs are asymmetrical, i.e. differ between two settlements." As it stands this statement is consistent with what we are saying, because it is ambiguous. What Burrows means, it turns out, by asymmetrical is the costs incurred by the various parties to the bargain are different, c.f. Burrows, op.cit {1970} pp. 43-45.
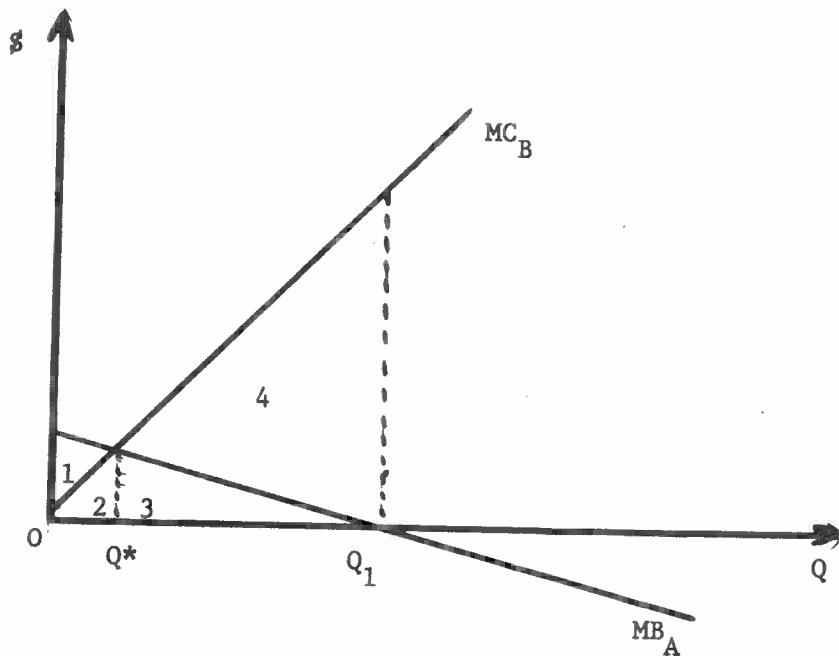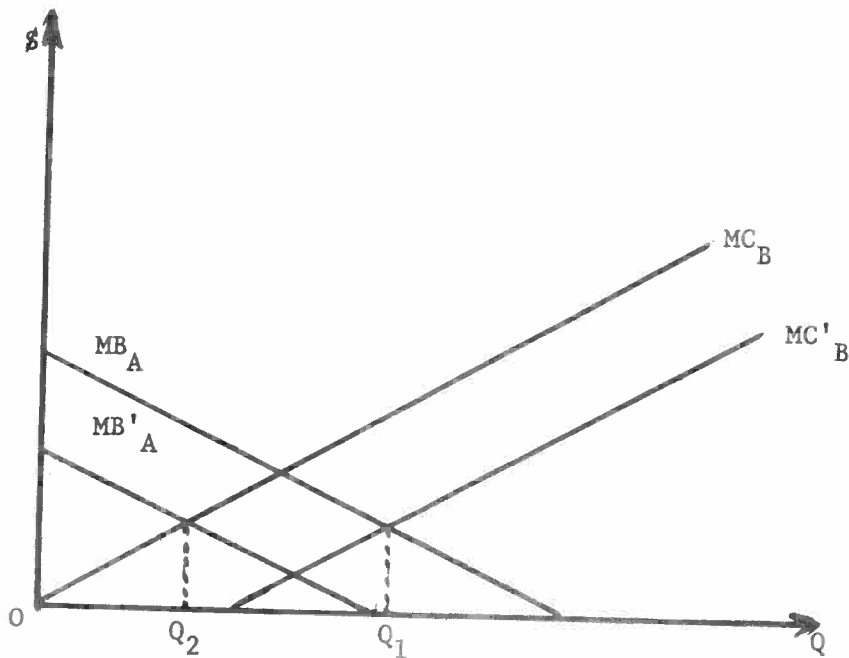
Figure 3.

Figure 4

In case where the costs of moving from a court designated starting point differ between such points but are less than the potential gains of moving to an equilibrium, the courts decision, of course, will not affect the equilibrium value of Q^1. But if such costs were known to the court to be less than the potential gains, then it seems clear that if the court is concerned at all about the total welfare of the community, it should rule according to the decision which minimises negotiating costs. Indeed, if the evaluation schedules without consideration of bargaining costs are even approximately known, the court could estimate where the equilibrium as a result of bargaining will be (Q*) and decree that to be it's decision. If this turns out to be not exactly correct, negotiation can always ensue but the costs of moving from the court status quo to the equilibrium will be minimised. Unfortunately, we have little reason to believe that courts are interested in such criteria; the courts are not in the business of arriving at decisions which insure economic efficiency, or even a more equitable distribution of income.

The _ex ante_ estimates by each party of the marginal gain and loss curves will, as pointed out earlier, affect _ex ante_ estimates of the divergence of conflict and hence estimations of the costs of bargaining. Recalling the discussion on this point earlier with reference to Figure 2, if B thinks the divergence of conflict given a starting point of Q_0^s is $Q_{11} - Q_0^s$ and if A thinks the divergence is $Q_{22} - Q_0^s$ then A's calculation of the divergence is smaller than, and hence his estimates of the costs of negotiating will be smaller than, B's estimates. When the estimated gains from such negotiations are taken account of, A may be more than willing to talk about reducing Q in exchange for compensation, but B may

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[1] In all of the analysis presented in this paper we are using partial equilibrium analysis. We have already noted that the status quo point or court designated settlement point will affect the distribution of income by affecting the amount of rents available and that this, in itself, may shift the marginal evaluation schedules, through an income effect. Moreover, a substitution effect may be operative in that the implicit price of Q is affected by various settlement and exercise costs so that the consumer substitutes away from Q — i.e. the marginal evaluation schedule shifts.

not wish to enter negotiations since he expects the costs to be high.
But once again, it is difficult to make any general statements in this
regard since the decision on whether re-arrangements are worthwhile
as viewed ex ante will be made with reference not only to the costs
of such re-arrangements but also to the gains to be had, for which
similar remarks to those just made are appropriate.

B.   The Extent of the Activity

        To the extent that the level of activity Q effects enforce-
ment and information costs, as discussed earlier, the marginal
evaluation curves drawn in the absence of such costs will need to be
re-drawn to take account of such costs.   The liability rule will
effect who has to do the enforcing and hence who bears the consequent
costs.   If A is deemed to have the property rights to Q by the
courts, then consequent to any bargain that A and B make, B must
bear the costs of enforcing such an agreement (and vice-versa).
Referring to Figure   and neglecting other considerations, a decision
in A's favour will in general shift B's curve down implying a private
settlement at Q_1 which will leave A engaging in more of Q than if
the court had rules in B's favour where A's curve is shifted down so
that a settlement could be reached at Q_2.   In the first instance
the reason B's cuve is shifted down is explained by remembering that
if we consider movements from right to left on the Q axis, the curve
labelled MC_B would more appropriately be labelled MB_B.   Since such a
curve is a net marginal benefit curve we subtract out the costs of
enforcement from the original curve causing it to shift downwards.

C.   Large Numbers Cases: Free Rider Problems and Asymmetry of Costs

        We turn now to a consideration of some problems associated with
cases involving large numbers of participants, particularly when there
are a large number on one side of the bargain.

        Since the costs of exclusion must be reckoned into the valuation
of one's property, the higher such costs, ceteris paribus, the lower
valuation one is likely to put on a particular set of property rights.

Looked at from a different angle, the higher the probability of <u>not</u> being able to exclude non-owners, the lower one's effective property rights and the lower the price one would tend to pay for the particular set of rights. If a law is passed prohibiting the arrest and prosecution of auto thieves and also prohibiting the use of private protection devices, the prices that people will offer subsequently for the purchase of automobiles will fall below the social value of the cars. Such low bids result from the reduction in control that one has over one's property and also from the ability to now steal other people's cars at no charge[1]. Hence prices offered for cars after passage of the bill will under-estimate the social value of cars since we can assume that the usefulness of a car remains the same if it is used by the legal owner or the "legal" thief.

If the costs of policing and excluding others from one's property are a function of the number of potential people one may have to exclude from sharing the benefits of one's property, then such costs are likely to be high in the case of a large number of participants. And such costs are likely to be high not only for the group as a whole but also for the individual participants. Particularly when such high costs are due to technological factors, then the decision to produce a particular resource may become a collection consumption decision. The provision of national defence has become the classic example here. Usually presented as an example of a "public good", it provides an excellent example of high police costs. Bids submitted for defence will tend to be below the social value of defence because each bidder can expect to enjoy at least some of the defence bought and enjoyed by others. If each citizen's tax liability with respect to defence were the amount of their bid then because of the presence of such exclusion costs, (meaning that it would be costly to exclude them from other's defence rights) each citizen will have the incentive to under-estimate his bids to the extent that he feels it does not jeopardise the changes of the government buying the amount of defence for which he would be willing to pay. In other words, "free rider" problems are present.

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[1] The example is taken from Demsetz, {1964} p. 17 - 18.

In the classic case of a group of citizens versus a factory
which fouls the air, such problems abound. The costs of organising
a diverse group of people for the purpose of common action may be
high enough to foreclude any joint action.   But the costs of devising
a system of exclusion from the benefits derived from cleaning the air
would be high enough to encourage free riders so that there is little
incentive for individuals to act themselves, and every incentive to
"leave it for others".

The problem presented in the two examples just cited is often
attributed to the fact that defence or (clean) air are indivisable
products or activities and that as such it is _impossible_ to exclude
non-owners.   For example, protecting Washington, D.C. from a nuclear
attack would also protect Maryland and Virginia.   But while this may
be true for some systems of defence, including those we normally think
of, it is not true for all systems of defence. It is, in principle at
least, possible to construct an atomistic system of defence whereby
each individual citizen has his own protective devices.   The extra
costs involved with such a system, relative to a system such as we are
familiar with, which would give equal levels of protection to each
citizen would be the costs of exclusion of defence[1].   The fact that
we do not opt for such exclusive systems is, in part, a result of the
high costs of such systems.   That is, it is not worth it to provide
the activity on an exclusive basis to individuals so that it is
provided in larger "indivisible" units and provides what may be termed
"automatic joint supply". (c.f. Buchanan {1966} and Millward {1970})
The high costs associated with these systems is a result of the large
number of potential participants to be excluded and is determined in
the large by technological factors.   In cases where there is no
present technology which would allow for exclusion, (e.g. cleaning
the air) we may properly regard the costs of developing that technology
as part of the costs of exclusion.   Developing a method of keeping
the air clean only above one's house or one's person is likely to be
quite expensive.

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[1]   Provided that the exclusive defence system chosen were the
cheapest one presently available.

The implications of such problems of obtaining true estimations of costs and benefits will differ according to the initial settlement of rights in the court.   If rights are settled in favour of the smokey factory, for example, then the affected group of citizens must organise and agree on a joint bribe.   As mentioned, any individual will have a tendency to under-estimate the true value to him of the benefits derived from the lessening of smoke in the hope of reducing his share of the payment so long as that underestimate does not reduce the probability of settlement.   In cases involving large numbers such a reduction is unlikely but even if the probability of settlement is not affected by under-estimation, the allocation of resources in the long run to smoke reducing activities will be affected since people in the smoke reducing business will under-estimate demand for their services.   Also, a "fallacy of composition" problem may creep in here;   any one individual's under-estimation may not alter the probability of settlement, but all under-estimates together may.   Even so, there is no incentive for the individual to correctly estimate the value of his contribution, for if he expects others in the group to do the same he gains nothing by bidding the full value to himself since his bid will not by itself affect the probability of a group settlement.   It is also reasonable to expect in cases involving large numbers that any one individual's bid will not influence the bids of others, and that he knows this.   In this event, regardless of how the individual estimates the behaviour of others, he will always rationally choose the free-rider option.

Returning to the smoke example, if the courts' decision is in favour of the group of citizens, two problems will arise.   Firstly, any member of the group may exaggerate his losses in the expectation of raising his share of compensation payments from the smokey factory's owner, so long as such bluffing does not affect the probability of settlement as seen by him.   If the settlement is attained the allocation of resources will be affected as the net benefits from using the air as a dump are altered.

Secondly, and particularly in cases where the status quo point affects the marginal evaluation schedules through income effects, the

minimum that some individuals would be willing to accept rather than forego the benefits of clean air may be higher than (their share of) the maximum the factory is willing to pay so that any settlement allowing continuation of the smoke in return for compensation payments is foreclosed. And given that the costs of an exclusive air cleaning process are high, an all-or-nothing decision regarding smoke or no-smoke may be settled in favour of no-smoke. In such a case, any decision other than one based on unanimity will impose costs on the minority whose minimum compensations were, taken together, acceptable to the factory. Hence, such a decision may not be Pareto optimal[1].

Let us now turn to the assymmetry aspects of organisation and exclusion costs. We shall first present the argument as it is usually presented.[2] Bargaining and organisational costs are expected to rise with the size of the group (Mishan assumes exponentially), so that consequently the costs of achieving a solution will be greater if the initiative to bargain must come from a large group than from a small group. And to the extent that this is operative, when the onus to negotiate lies with a large group the probability of negotiating from the status quo is lower than if it lay with the small group on the other side of the bargain. But there are a few problems with this argument. Firstly, as Burrows points out, the reasoning involves a non sequitor. Certainly the costs of settlement will be higher for large group - small group confrontations than for disputes where there are a small number of participants on both sides. If the onus to negotiate lies with a large group of "offended" people then the costs of negotiating will involve those

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The unanimity rule is examined in Buchanan {1962}. The second problem here is presented by Burrows op.cit., p. 50, in a slightly different fashion where in his case "some members of the group prefer the activity to cease rather than receive compensation". But this implies that there is no price which they will accept in compensation for foregoing the activity. This seems unreasonable.

2. Mishan {1967} Sections V and VI. Burrows op.cit.p. 45. also presents this argument but for purposes similar to our own - as a reference point for criticism.

associated with identifying members of the group, communicating between
them, reaching agreement on a common policy (i.e. the total offer to be
made and each members' share) and contacting and bargaining with the
"offending" factory for example.   But if the factory is liable, similar
activities will have to be engaged in if it wishes to negotiate to lift
a court injunction, so that similar costs of negotiation will arise.   Such
costs will be associated with identifying members of the offended group,
contacting and bargaining with them separately or as a group, as well as
costs incurred by the group in reaching any agreement on its reactions
to offers made by the factory and on shares of compensation accruing to
each member of the group.   We cannot in general then expect that the
costs of bargaining will be lower under alternative legal settlements
involving small-large conflicts.

          It may well be, however, that in many circumstances even
though a single firm must engage in the same kinds of negotiating and
enforcement activities as a large group, the costs of such activities
to the firm are lower.   This may occur because the company may enjoy
economies of scale in decision-making, communications and information
gathering.   And if we regard the managers of firms as people who have
essentially specialised in these kinds of activities, a reasonable
assumption given the observed mobility of executives among firms in
different industries, we would expect these costs to be lower for this
reason as well.   Such considerations would lend credence to the
asymmetry argument.   But the argument that the legal specification of
rights will place the onus to negotiate on the party (or parties) who are
decided against, which in implicit in the asymmetry argument, is not correct
for it neglects the two sided nature of any bargain or trade.   If gains
from trade are to be had, as is likely with a court specified status quo
which is largely determined on non-economic grounds, then it does not
matter with whom the onus to bargain lies.   Indeed, it will lie with both
parties since they both stand to gain from the bargain.   For example, if
A's bargaining costs exceed the maximum attainable gains from a bargain
and B's costs are lower than such gains, then it will pay B to approach A
to make a deal even if he is not liable.   In our factory - citizen example
(with citizens liable) suppose the maximum that the citizens are willing to
pay for an injunction against smoke is $1000 - i.e. that this represents
the maximum gains to them of the injunction - and suppose that the minimum

the factory is willing to accept for an injunction is $500 - i.e. the
loss to it from not using the air as a dump for smoke.   If the costs
of the group organising and negotiating with the factory exceed $500,
say $600, then they will not initiate bargaining.   But if the factory,
because of its expertise in organisation etc. and because of economies
of scale in communication and information gathering, can do the
bargaining for say, $400, then it will clearly pay the factory to approach
the citizens with regard to negotiating a ban on smoke, even if the courts
have decided in the factory's favour.   There is $100 to be gained from a
trade or rights, regardless of with whom the "onus" to negotiate lies.   If
the citizens are initially assigned the air rights and no welfare effects
are operative, then the rights will clearly remain with them.

Similar remarks apply, particularly in the long run, to the
argument that if a factory is made legally liable for pollution damage
it will have "an immediate and often powerful incentive to direct resources
into discovering low cost devices"[1] for reducing the costs of polluting,
including compensation payments.   The converse of the argument is that
if the polluting firm is not made liable it will merely continue to pollute
the environment.   But if it is not liable and if it expects that it can
reduce the amount of say air pollution resulting from its activities by
the development of some device then it has every incentive to approach the
citizens for a subsidy to develop the device.   The reason that it may not
is that the costs of doing so may erase any gains to be made by the firm
from negotiating for the subsidy.

VI.   Conclusions and Policy Implications

The analysis of this essay has shown, at a minimum, that the
externalities problem is exceedingly complex.   Indeed, it is not meaningful
to speak of the externality problem since there are so many different factors
that may come into play.   A more fruitful approach is to consider each case
with its individual characteristics before any general statements regarding
that one specific case are made.   Another problem with analysis of the kind
we have just been engaged in is that it is always partial equilibrium analysis.

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[1]   Mishan, {1967} p. 277.

While it <u>has</u> been made a little more "general" by considering such
things as the allocation of resources to information gathering
exclusion activities, (traditionally omitted) it is still partial
equilibrium since second order effects have been ignored.   Thus,
such problems as the air pollution activities of a firm engaged in
making anti-water pollution devices, monopolistic elements of govern-
ment subsidised firms that develop such devices, etc. ignore a host of
second best problems.   The omission of such problems should not imply
that they are not relevant considerations in forming policies for the
real world.   They have been left out here simply to keep the scope of
this essay manageable.   Certainly, second best problems will appear
and they should be analysed in the context of the particular problem
under study .

It should be clear, therefore, that there can be no one cure
for externalities; each case must be considered individually. The only
meaningful general statement we can make is that there are a variety of
alternative mechanisms that can be used to allocate the resources involved
in an externalities case.   Each of these, like the market, can only be
implemented and maintained at a cost.   If our objective is to maximise
the total product of our economy then that mechanism should be chosen
which is most efficient - i.e. allocates resources to their most desired
users at the lowest cost.   But <u>ex ante</u> we cannot in general say which
of these mechanisms - e.g. government tax/ subsidies, ad-hoc allocations,
mergers, private negotiations, court negotiations, private middleman or
preservation of the status quo - will be the most efficient.   In the
final analysis, empirical work is called for to determine the costs and
benefits of particular institution schemes and to ascertain the importance
and validity of the hypotheses put forth in Section IV.

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