For Martha
PREFACE

*Economic Foundations of Law and Organization*, as the name suggests, provides an economic explanation for law and organization, and thus is appropriate for any course dealing with these topics. It is meant as an introductory text, but I believe that the book contains many ideas that are new and of interest even to those who are experts in the field. Unlike other texts on the economic analysis of law, this text is not organized by legal categories (property, torts, contracts, etc.), but by economic theory. The purpose of the book is to develop economic intuition and theory to a sufficient degree so that one can apply the ideas to a variety of areas in law and organization. Just as when learning supply and demand, one applies these curves to the market for oranges, beef, illegal drugs and marriage, rather than studying each of these markets in particular, the ideas learned here cut across the standard legal categories. As a consequence, this book does not give a complete picture of the law in any one area; indeed it does not cover everything that economists have said about any particular topic in the law. On the other hand, it provides a strong and cohesive explication of various economic ideas in the context of interesting legal topics. As a result, this book could be called *Microeconomics Made Interesting* and be used as a complement to standard texts in intermediate microeconomic theory.

The pedagogical intent is to focus most chapters on a particular theoretical approach so that the reader truly understands the underlying logic. The book employs both formal logic and intuition so that the reader will find the argument compelling. I want the reader to walk away with a clear understanding of the material not just a vague idea regarding the results. For example, I want the reader to have more than a vague idea that negligence rules are good. I want readers to be able to demonstrate on their own that the equilibrium outcome under a negligence rule is efficient. This is the key to how I have written much of the book. For each chapter the reader should be able to reproduce the underlying logic of the chapter and apply it elsewhere. I do this by focusing on a particular model of the world rather than bringing in lots of ideas at once. I make the chapters short and to the point. When chapters are too long, students tend to read the material quickly as if they are reading a novel rather than read carefully so that they can reproduce the logic. When chapters cover too many ideas or too many alternative models, students either conflate the models or just get a sense of the results rather than a deeper
understanding. Instead, I concentrate on the economic model that yields the most insight into the legal issue.

Speaking of students, I would like to thank all of my students who suffered through earlier versions of this book. It was their questions in class and mistakes on exams that lead me to simplify and clarify. I would also like to thank Judy Walsh who as a teaching assistant gave me invaluable advice about writing when I first started on this adventure.

Finally, if you want to discuss any issues raised in this book, I am at wittman@ucsc.edu
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INDEX
1. INTRODUCTION

Should a surrogate mother be allowed to keep the fetus? Should the hospital, the donor, the Red Cross or the patient be liable for the harm if a patient contacts hepatitis from a blood transfusion? Should there be regulations against smoking in airplanes? Should plea-bargaining be allowed? Should hostile corporate takeovers be encouraged? Should a bystander be found liable for not rescuing a drowning person if the rescue could have been accomplished with little risk to the potential rescuer? Should homeowners be allowed to force a cattle feedlot to move without compensation by the homeowners if the cattle feedlot was there before the homes were built? Why are nuclear power plants subject to strict liability? Why are there few consumer cooperatives? When should a firm vertically integrate? How should Congressional committees be structured? What should be the creditor priority in bankruptcy?

A. Economics Provides the Analytic Framework for Answering these Questions

The answers to these questions are found in economic theory. In this book we use economic analysis to explain various areas of the law, including civil procedure and criminal, corporate, contract, accident, bankruptcy, and environmental law. Along the way, we explain why relationships are organized in a certain way. For example, why McDonalds™ is a franchise, while Ace Hardware Stores™ are independently owned and Safeway™ stores are a single corporation. As another example, we explain why stockholders have limited liability. Hence, the title of this book – Economic Foundations of Law and Organization.

The connection between law, organization and economics is very close. Economics is the study of what, how and for whom. Standard textbooks in economics define the field as the study of resource allocation in the presence of scarcity. Laws affect resource allocation and help to determine what, how, and for whom. For example, a law that finds trucking companies liable for accidental harm will create incentives for more careful driving by truckers. A well-ordered society will tend to choose laws that promote economic efficiency. Laws create a public ordering; that is, they organize society in a certain way. Private entities are also organized in a certain way. For example, in corporations, stockholders provide capital and managers of the firm
provide day-to-day decisions. Economics provides the key to understanding why firms and society are organized in particular ways.

Economics also provides insight into many ethical issues. Why is theft wrong? If three men are in a lifeboat and only two can survive, is it ethical to throw one of the people overboard, and if so, how should this be decided? And returning to some of the questions posed at the beginning of this chapter (because legal and ethical issues are often entwined), when does being first deserve extra consideration and what duties are owed to strangers? Thus the title of the book could also have been “Economic Foundations of Law, Organization and Ethics.”

B. Organization of This Book

This book is organized into sections. The sections need not be read in order, the major exception being section B on the Coase theorem, which should be read first if the reader is not well acquainted with the Coasean analysis.

Section A introduces the concepts of rationality and efficiency and provides the underlying rational for cost-benefit analysis. Section B introduces the concept of transaction costs and argues that concept is critical to our understanding of law and organization. Section C is devoted to developing the economic intuition needed to understand the law. Section D discusses when and why property rights, liability rules, communal rights, restitution or regulation is chosen instead of the other methods of protecting entitlements. Along the way, blackmail, patents, and the takings clause are discussed. Section E derives optimal liability rules (including the optimal level of punishment for criminals). Among other things, we explain why liability rules differ for falling trees, automobile accidents, and dangerous pets. Section F considers how sequential inputs changes the analysis provided in section E. Topics such as coming to the nuisance, the Good Samaritan rule, and mitigation of damages are discussed. In section G we consider the role of the courts in contract law, including marriage contracts. In section H we focus on warranties of one type or another. We consider exploding soda bottles, automobile warranties, and lawnmower accidents. Section I is concerned with the allocation of risk and the role of insurance in the law. This topic is far beyond the narrow confines of what people ordinarily think of as
insurance. For example, we cover royalties for artists, which can be viewed as insurance for investors. We also discuss problems involved in trying to regulate the insurance industry as well as problems that arise because deposits in savings and loans are insured. Section J is the longest section. It is devoted to governance and organization and answers questions such as the following: why are investor-owned firms common, but worker-owned firms rare? Why do we have franchises? And how is congress organized? K, the final section, is devoted to bargaining in the shadow of the law.

SUGGESTIONS FOR FURTHER READING


REVIEW QUESTIONS

1. What does economics have to do with the law? Is it about how much we pay for lawyers and prisons? (3)
A. ECONOMIC FUNDAMENTALS – RATIONALITY AND EFFICIENCY

In this section, we consider two fundamental building blocks of economics – rationality and efficiency.¹

Almost all of economics assumes rational behavior by individuals in their roles as consumers, workers or owners of businesses. The focus of rationality is typically on how individuals respond to prices. Rational consumers have downward sloping demand curves and rational business owners have upward sloping supply curves. Much of the legal system also assumes that individuals respond rationally to prices. If individuals are rational, then, other things being equal, larger fines for speeding will reduce the number of speeders. Suppose that individuals were irrational in this regard. Then the legal system would reduce fines for speeding in order to reduce the number of speeders, unless the legal system, itself, was irrational, in which case it would do the opposite. As this last thought experiment suggests, assuming irrationality leads to some unrealistic predictions about human behavior and legal rules.

Chapter 2 is devoted to a deeper discussion of rationality. We first show that the economist notion of rationality is nowhere near the cartoon caricature of rationality presented by the critics of rational behavior. Next, we show that when people are rational, the price reflects the benefit of the last item purchased. That is, if a person is rational, then paying $10 for an item means that the person valued the item for at least $10. This rather trivial insight allows us to undertake cost-benefit analysis, the subject of chapter 4.

The theme of this book is that laws can be evaluated according to whether they are economically efficient and that many laws (particularly judge made laws) do, indeed, promote economic efficiency. But what does it mean to be economically efficient and why is that criterion chosen instead of another. This is the subject of chapter 3. Economic efficiency (Pareto optimality) is a

¹ In chapter 15, we will consider the notion of equilibrium, another fundamental concept in economics.
non-controversial method of assessing welfare. It does not mean that individuals work without taking lunch or that pollution is ignored. Instead it just means that no one individual’s welfare can be increased without reducing another individual’s welfare. In chapter 3, we discuss the concept of economic efficiency in depth because it is hard to understand from a mere definition. We also discuss why other approaches such as the utilitarian approach and various distributive approaches are not very helpful in evaluating legal rules.

In chapter 4 we consider cost-benefit analysis. Cost-benefit analysis uses prices to measure welfare. As previously indicated, this is justified by the argument presented in chapter 2 that rational individuals are willing to pay $X for an item only if the item is worth $X to them. We show how cost-benefit analysis is related to economic efficiency and why as a practical matter it is used rather than the Pareto criterion. Thus the theme of the book can be restated as follows: legal rules and organizational structure are often chosen on the basis of their costs and benefits.

Section A can be seen as the underlying argument for the use of cost-benefit analysis (to the exclusion of other criteria) in evaluating the law. For those who are already comfortable with the concept and don’t desire a deeper understanding of cost-benefit analysis and don’t need to be convinced that rationality is a plausible starting place for analyzing human behavior, Section A (and in particular chapters 2 and 4) can be skipped. For the rest, Section A provides the justification for the economic approach to law and organization.
2. RATIONAL BEHAVIOR, PREFERENCES AND PRICES

The basic premise of this book is that individuals generally act rationally. Since there is often confusion regarding what is meant by rationality and a great deal flows from assuming rationality, it is useful to start with a definition.

A. Rational Behavior

The following is how economists define rationality. If a person can rank order her preferences (e.g., Tom prefers (A) to travel around the world and eat caviar every night over (B) working 40 hours a week and eating burritos every night over (C) playing video games all day, living with his parents and eating steak and potatoes) and the person chooses his most preferred feasible alternative, then the person is rational. Rationality is a plausible assumption regarding human behavior. Isn't a better theory of human behavior that people do what they prefer to do

\[2\] More formally: To act rationally an individual must have a complete set of ordered preferences over the set of outcomes and these preference rankings must be both transitive and reflexive. Transitivity implies that if you prefer chocolate to vanilla and vanilla to strawberry ice cream, then you prefer chocolate to strawberry ice cream. Reflexive means that a person does not strictly prefer something to itself. Hence a person is indifferent between a bowl of chocolate ice cream and a bowl of identical chocolate ice cream.
rather than that people behave randomly (they are arational) or that they consistently act against their own preferences (they are irrational)\(^3\)

For the most part, the book is devoted to explaining aggregate or market behavior rather than a particular individual’s behavior. While one might argue that a particular person is either irrational or uninformed, it is much harder to claim this to be the case for the market.\(^4\) Thus, for example, one might argue that a manager of a particular firm is paid more money than she is worth, but it is much harder to argue that managers in general tend to be paid more than they are worth. Because we are interested in aggregates, our predictions are not undermined if some people do not act rationally.

Note that there is no need to assume that individuals are perfectly informed. Rational people can be misinformed and make mistakes. For example, they may carry a raincoat on a day when it doesn't rain. However, people will not persist in their mistakes if the evidence is to the contrary. They will not carry a raincoat in Santa Cruz in July once they learn that it does not rain there in the summer. Of course, carrying a raincoat when it is does not rain is not very costly. If mistakes were very costly, rational individuals would gain more information ahead of time. For example, first-time strawberry farmers in Santa Cruz County will install irrigation systems to grow their crops in the summer rather than rely on rainfall.

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\(^3\) Presumably, individuals at different times are characterized by one of the three (rationality, irrationality, and arationality). The problem is that unless we can predict which characterization is operative (which would be the case if we could detect which part of the brain is being used or how much alcohol was consumed, for example), we can only determine ex post which one holds. Under such circumstances, in order to predict rather than merely define behavior, we need to go with the characterization that works the best. The argument here is that rationality works best.

\(^4\) This holds when the information is available contemporaneously. Obviously, in the nineteenth century doctors did not know that penicillin killed bacteria.
While people make mistakes, it is unlikely that people are consistently prone to misjudgments in a particular direction. I am skeptical of arguments that assume that people tend to underestimate or overestimate the dangers of some activity (for example, underestimating the dangers of taking prescription drugs) when such information is public. Here, the basic premise is that some people may overestimate and others may underestimate the probability of a bad outcome, but over all issues, the average person’s beliefs do not systematically differ from the experts’ beliefs in a certain direction.

Note that being rational does not mean that the person is selfish. Rational people may be altruistic; but being rational, they will try to achieve their ends in the best way possible. A surgeon trying to save someone’s life will use sterilized equipment when possible and will not purchase more expensive equipment if it is not better.

When it comes to producers, there is very strong pressure for rational behavior with a particular goal – profit maximization. The reason is that large deviations from profit maximization are likely to result in the firm going out of business. Consider a farmer in North Dakota where the winters are cold and there is not much rain. If the farmer prays for rain but does not install an irrigation system or plants bananas instead of wheat, he will not survive for very long. Of course, if the farm is otherwise very profitable, there is room for some behavior that modestly deviates from profit maximization (for further discussion, see the chapter 33 on agency costs in corporations).

In this book, we sometimes use mathematics including calculus to explain people’s behavior and at other times the arguments are counter-intuitive. A common criticism is to assert that people do not have the cognitive skills to make such judgments. But we are not assuming that individuals actually use calculus in their decisions. Rather that calculus is a useful way to characterize their behavior. Perhaps, the easiest way to understand the logic behind my argument is to consider maple trees. The leaves on maple trees are not stacked in a row one right behind the other; instead they are arranged in a way to maximize the amount of light falling on all of the leaves. Advanced mathematics is needed to solve this maximization problem, but, as far as I
know, no maple tree has ever gone to college. If trees can act rationally, it should not be unreasonable to assume that people act rationally as well.

So for the remainder of the book, we will assume that on average producers and consumers are rational and do not have biased expectations.

B. Advertising #5

Now it is possible that people are easily manipulated by advertising (and therefore they do not make rational choices). One could argue that without television advertising, fewer brand names would be sold. It would be much harder to argue that without television advertising, people would drink milk instead of smoke cigarettes, eat raw vegetables instead of fast food, buy bicycles instead of muscle cars, live in teepees instead of houses, and wear clothes until they fell apart instead of until they became unfashionable.

Of course, firms that advertise are not doing it for our pleasure. They are doing it gain sales. Sales are gained in the following ways: 1) Some advertising is directly informative. When Nissan™ advertises the Titan™ truck, not surprisingly, it is advertising that it now provides large trucks. 2) Some advertising is just a reminder that the brand exists and serves as an implicit statement that the firm stands behind its product. A brand name is likely to be of higher quality than its unadvertised counterpart. Advertising content is irrelevant in such cases.6

Now it is possible that advertising tricks people. For example, the beautiful female in the passenger seat of a Corvette™ advertisement might convince someone to buy the Corvette in hopes of attracting similarly beautiful women. But if manipulation were that easy, then Prius™ would engage in a similar tactic and possibly sellers of hamburgers, milk, and bicycles would do

5 The # mark indicates that the subsection can be skipped.

6 The main affect of banning cigarette advertising on television has been to make it more difficult to create new brands. There has been a secular decrease in cigarette smoking independent of the ban.
the same. In which case, this manipulation would no longer determine what the susceptible person would buy.

Part of our enjoyment of life is aesthetic. Minimum daily food requirements can be met by spending less than $3.00 a day, but who wants to eat like that if they can afford to spend more? No one argues that it is advertising that drives us to eat more than the minimal cost diet. Yet when a person chooses a muscle car (such as Corvette), others argue that the person is irrational (it does not maximize fuel economy) or that the person is susceptible to advertising. But advertising is geared to the person's aesthetic sensibilities and brand choice allows others to infer preferences of the purchaser. All of us employ different mental images of the typical Corvette owner in comparison to the typical Prius owner. Advertisers know that our minds are not a empty tablet; Prius does not engage in direct mail campaigns to Corvette owners.

Of course, at the margin, advertising does have an effect. Advertising tries to capture the otherwise indifferent consumer of a competing brand. But the effect of advertising is limited. Burger King™ can advertise day and night that the Whopper™ is better than the Big Mac™, but the demand will decrease dramatically if the price of the Whopper is doubled.

C. Preferences and Utility Functions

The fundamental building block of rationality is that each individual can rank order their preferences and then choose the highest feasible alternative. But writing down preference rankings is a time consuming matter. As a result, economists tend to formulate their discussion of preferences in terms of utility functions, which are a more concise method of characterizing preference relationships.

To illustrate, we will consider a very simple preference ranking. Suppose that a person prefers more apples to fewer apples and more bananas to fewer bananas, but the person is indifferent between having two more bananas or one more apple. The person’s preference rankings from most desired to least desired is then
{2 apples} or {4 bananas}
{1 apple and 1 banana} or {3 bananas}
{1 apple} or {2 bananas}
{1 banana}
{no fruit at all}

This ranking does not include the possibility of half an apple or 10 apples. So such lists can be very long.

Fortunately, this preference ordering can be represented by a simple utility function: \( U = 2A + B \). We can easily establish that this utility function represents the preference ordering above. For example, one apple and one banana provide the same utility (2 times one plus 1 times one) as three bananas (2 times zero plus 1 times 3). If individuals are rational, then they maximize their utility given the feasible set. For example, if a person has $2.00 to spend and apples and bananas cost $1 each, then the person will buy two apples.

Notice that the same preferences can also be characterized by the following utility function: \( U = 100 + 20A + 10B \), as, once again, one apple is worth two bananas, and more apples or more bananas means more utility. In choosing between apples and bananas, it is not the absolute size of the utility that counts, but the relative size. This means that utility is an ordinal concept -- we can say that the individual gets greater pleasure from eating two bananas than from eating one. We cannot say that the individual gets twice as much pleasure from eating two bananas than from eating one. The latter is known as a cardinal measure. Since we cannot measure happiness as we measure weight (a cardinal measure), it important that we treat utility as an ordinal relationship. And of course that is just what a ranking is – ordinal.

D. Prices

*If people are rational, we can translate their preferences into prices.* If you spent $10 to buy a bottle of Kendall-Jackson™ Zinfandel, this is because you preferred doing that than spending your $10.00 elsewhere (e.g. spending $10 on Charles Krug™ Zinfandel). And being
rational, you would not change your mind and buy Charles Krug if the price of Charles Krug increased from $10.00 to $11.00 or more dollars and everything else remained the same. So we can say that Charles Krug was not worth more than $10 and that Kendall-Jackson was not worth less than $10 to you when you buy KJ but not CK. Indeed whenever you make one choice over another, even if money is not involved, we can translate the choice into money by saying that you would have paid more for what was chosen than for what was not.

The advantage of prices is that they are observable and allow for easy comparison. If people are rational, the marginal utility from the last dollar spent on one good (say apples) should equal the marginal utility from the last dollar spent on another item (say pears). Suppose to the contrary -- that they would have gotten more pleasure from consuming an additional dollar’s worth more of apples than from consuming that last dollar’s worth of pears. Then they would have reduced their purchases of pears by a dollar and increased their purchase of apples by a dollar. This logic repeats itself until we do have equal marginal utility per dollar. If apples cost $1.00 each, we can say that the last apple you purchased was worth a dollar. And if the apple monster destroys one apple in each of one-hundred thousand homes, we can say that the cost to people’s welfare was the equivalent of losing $100,000. We need not say that Joe Jones would have been just as willing to have lost his toothbrush, Mary Bones would be indifferent between losing the apple and losing her salt-shaker, etc., even though this might be true, as well.

E. Concluding remarks

The concept of rationality is rather trivial. Nobody had to read this chapter to discover that people generally choose what they prefer. However, as we will show in the remainder of the book, rationality in combination with other simple ideas produces non-obvious and deep insights into law and organization.
SUGGESTIONS FOR FURTHER READING

Experimental evidence suggests that people often have a basic notion of fairness rather than being purely self-regarding (selfish). There is also some evidence that individuals do not always act rationally. These experimental results have been incorporated into what is now known as behavioral law and economics (see for example Sunstein, 2000). This is an interesting area of investigation, but at the present the results are not sufficiently compelling to overturn the analysis based on rational actors.

REVIEW QUESTIONS

1. What is meant by economic rationality? (3)

2. If people are rational, why are there stupid adds on TV that do not discuss the merit of the product? Aren't consumers just being persuaded to irrationally purchase goods? (6)

3. What is the relationship between preferences and utility functions? (2)

4. If people are rational, what is the relationship between preferences and prices? Explain. (6)

REFERENCES

3. PARETO OPTIMALITY VERSUS UTILITARIANISM

Economics is used as both a descriptive and a prescriptive theory of human behavior and the law. A descriptive theory describes how things are, while a prescriptive theory explains how things should be. In the last chapter, we argued that rationality was a descriptive theory of human behavior. It is easy to see how it could also be used as prescriptive theory. If you want to be happy, choose your most preferred feasible alternative. Of course, in general, prescriptions and descriptions need not be the same. If you want to do well in a class, you should have studied for the exam, but instead you watched Terminator 3. Economic analysis of law also has descriptive and prescriptive elements. It is argued throughout the book that many laws obey a certain economic logic and furthermore that they should do so. But what is the desired objective of the law? The answer is that the law should promote efficient outcomes. In this chapter, we will introduce the concept of Pareto optimality, a term that economists often use to mean efficiency. In the next chapter, we will discuss the role of cost-benefit analysis.

Before delving into the particulars, it is useful to reflect on the more general problem of collective preference and choice when the basic component of analysis is individual preferences. As already mentioned, when there is only one person and we want to maximize the person’s welfare, we instruct the person to choose his/her most preferred feasible position. Now suppose there are two people, X and Y, and X prefers A to B to C to D and Y prefers C to B to D to A. What should society’s preference ranking be? Should it make any difference on society’s preference ordering if X greatly prefers B to C (as would be revealed if X preferred B over a 90% chance of A and a 10% chance C)? Should it make any difference to society’s preference ordering if D is no longer available so that A is no longer ranked 4th by person Y?

Every society must solve the problem of collective choice, but of course, not all do it with welfare or justice in mind. Collectively, the prescriptive and the descriptive are often at odds. Dictators may maximize their own utility, but the utility of others counts for very little, if at all. In this context, the search for a prescriptive theory of social welfare may seem quaint. Nevertheless, such musings have occupied philosophers for thousands of years. We will now show how the ideas regarding welfare have progressed overtime and why the prescriptive goal of
efficiency is held in such high regard by economists. In later chapters, we will argue that the law tends to promote efficiency.

A. Maximizing the sum of utilities

Jeremy Bentham (1748-1832) is considered the father of utilitarianism and sometimes the father of the economic analysis of law. It was his view that that society should create the greatest amount of happiness for the greatest number of people. This prescription can be translated into the following formula – society should maximize the sum of utilities. More formally, a society of N individuals should maximize \( U_1 + U_2 + U_3 \ldots U_N \), where \( U_i \) is the utility of the ith individual. It is convenient to show this relationship in a diagram (Figure 3:1). The axes represent X’s and Y’s utility in “utiles.” The downward sloping 45 degree lines are society’s indifference curves, Society is indifferent between {X having 10 utiles and Y having 0 utiles} and {Y having 10 utiles and X having 0 utiles} or anything on the line in between (such as both having 5 utiles) as in all these cases the sum of utilities adds up to 10. The higher 45-degree line represents a higher society indifference curve as the sum of utiles is higher. Using the language of preference ranking, society prefers any point on the higher line to any point on the lower line, but society is indifferent between any two points on a particular downward sloping 45-degree line. The curved line and all the points below is the utility possibility set or feasible set. It corresponds to the production possibility set but everything is translated into utiles. Society chooses that feasible point, B (for Bentham), which is on the highest society indifference curve. In this example, maximizing the sum of utilities suggests that X ends up happier than Y.

As we can see, maximization of utilities does provide an answer. It also has certain nice qualities. In particular, it treats different people the same – everyone’s utility is weighted equally. However there is a serious problem with Bentham’s prescription. It requires cardinal interpersonal comparisons of utility. That is, it not only requires us to measure a person’s utility as one would measure a person’s weight, it also requires us to compare one person’s happiness to

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7 Bentham was reading while he was still a toddler and was studying Latin by the time he was 3. He has been preserved and can be seen at University College, London, sitting on a chair.
another. But neither is possible. So economists have generally avoided the maximization of utilities approach. This is somewhat ironic since people typically associate economics with utilitarianism and of course utility functions are a basic part of economic methodology. But as was shown in the chapter 2, utility is an ordinal concept, not a cardinal one.

B. Pareto Optimality

It was Vilfredo Pareto (1848-1923) who made the above argument against utilitarianism, and who provided an alternative ordinal measure that required no interpersonal comparisons of utility.\(^8\) The essential idea is that if we can undertake a policy that will make one or more people

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\(^8\) Pareto was a great mathematical social scientist who developed various ideas that are now named after other people. What is known as the Edgeworth-Bowley box in economics was developed by Pareto and spread by his student Bowley. What is known as Zipf’s law in sociology was discovered decades earlier by Pareto and is known by people outside of sociology
better off (because they prefer the new policy) without making anybody worse off, we should undertake such a policy. Such a move is known as a *Pareto improvement*. When we have a situation where no Pareto improvements can be made, we say that the outcome is *Pareto optimal* or *efficient*. More formally the definition for Pareto optimality is as follows:

**DEFINITION:** To be Pareto optimal means that no one can be made better off without making someone else worse off. To not be in a Pareto optimal situation means that it is possible to make someone happier without making someone less happy.

The concept is an extremely useful one. In this world, people have different religions, values and tastes. Some prefer rock music while others prefer classical music; some people like to drink alcohol and other’s think that it is immoral to do so; and some people believe that the Bible is the source of truth, while others think that the Koran is. Even if there is broad agreement on certain values, most of these values are contingent. Is it “thou shall not kill” or thou should not kill unless it is in warfare, or perhaps not even in warfare unless it is also in self-defense? There is very little that we can agree on. The one concept where almost everyone can agree on is that if in going from situation A to situation B, we make some people better off (in terms of their own preferences and values) and nobody worse off (in terms of their preferences and values), then B should be chosen over A.

Because Pareto optimality has a double negative in its definition, the definition is often confusing to the reader. It is therefore useful to consider some simple examples to illustrate the concept. Suppose first that we have two pears and one apple to distribute costlessly between Xavier and Yvonne (X and Y, for short). We will assume selfishness, because it is easier to illustrate. Of course, one could think of more complex examples (building more cars or buses and more farmland or more forest) with altruistic people, but that would create too much confusion.

as the Paretian distribution. Pareto can also be said to be a founding father of cognitive dissonance in psychology.
<table>
<thead>
<tr>
<th>Xavier</th>
<th>Yvonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 2 pears, 1 apple</td>
<td>2 pears, 1 apple</td>
</tr>
<tr>
<td>2. 2 pears</td>
<td>1 pear, 1 apple</td>
</tr>
<tr>
<td>3. 1 pear, 1 apple</td>
<td>1 apple</td>
</tr>
<tr>
<td>4. 1 pear</td>
<td>2 pears</td>
</tr>
<tr>
<td>5. 1 apple</td>
<td>1 pear</td>
</tr>
<tr>
<td>6. nothing</td>
<td>nothing</td>
</tr>
</tbody>
</table>

From this list we can see that both Xavier and Yvonne would like all of the fruit for him or herself. If this is not possible, Xavier would then like to have 2 pears; while Yvonne would most like to have 1 pear and 1 apple if she could not have three pieces of fruit. As can be seen, Xavier prefers pears to apples and Yvonne prefers apples to pears.

Since there are at most 2 pears and 1 apple to allocate, both Xavier and Yvonne cannot get their most preferred alternative. If Xavier gets, his most preferred alternative (2 pears and an apple), then Yvonne must get nothing and the allocation is \( \{X1, Y6\} \). If Xavier gets his second most preferred alternative (2 pears), then Yvonne gets either nothing or her third most preferred alternative (1 apple). The feasible sets are thus \( \{X1, Y6\}, \{X2, Y3\}, \{X2, Y6\}, \{X3, Y5\}, \{X3, Y6\}, \{X4, Y2\}, \{X4, Y3\}, \{X4, Y5\}, \{X4, Y6\}, \{X5, Y4\}, \{X5, Y5\}, \{X5, Y6\}, \{X6, Y1\}, \{X6, Y2\}, \{X6, Y3\}, \{X6, Y4\}, \{X6, Y5\} \) and \( \{X6, Y6\} \).

Since both Xavier and Yvonne prefer more to less (and reallocation is costless), any allocation that does not allocate all of the fruit is not Pareto optimal. An example is \( \{X5, Y6\} \). \( \{X5, Y5\} \) is a *Pareto improvement* over \( \{X5, X6\} \) since one person is made better off while the other person is not made worse off. But \( \{X5, Y5\} \) is still not Pareto optimal.

More interesting is the case where the fruit goes to the wrong person. Consider \( \{X5, Y4\} \) where Xavier gets an apple and Yvonne gets 2 pears. Both would be better off if Xavier got the
two pears and Yvonne got the apple \{X2, Y3\}. So \{X2, Y3\} is a Pareto improvement over \{X5, Y4\}. Another way of saying this is that \{X2, Y3\} is *Pareto superior* to \{X5, Y4\}.

More important, \{X2, Y3\} is Pareto optimal. The only way to make Xavier better off is by giving him everything, in which case Yvonne gets nothing, Y6, which makes her worse off. The only way to make Yvonne better off is to make Xavier worse off. If we give Yvonne 1 pear, then Xavier will be worse off. At \{X2, Y3\}, there is no way to make X better off without making Y worse off and there is no way to make Y better off without making X worse off. Hence \{X2, Y3\} is Pareto optimal.

One good thing about the concept of Pareto optimality is that if we value people’s individual happiness, then we can agree that \{X2, Y3\} is to be preferred over \{X5, Y4\}. Pareto optimality has two other characteristics that are very desirable for practical applications in the real world. (1) The concept deals with preference orderings, not happiness levels (cardinality). Xavier prefers X1 over X2. Nowhere do we say that Xavier is twice (or thrice) as happy with X1 than with X2. (2) Furthermore, Pareto optimality does not require any interpersonal comparison of happiness or utility. We do not compare Xavier’s happiness with Yvonne’s happiness, and say that Xavier is happier.

Unfortunately, these desirable characteristics of Pareto optimality also have negative implications. In particular, there may be many Pareto optimal outcomes and Pareto optimality provides no guide to choose among them. For example, Xavier getting all of the fruit and Yvonne nothing \{X1, Y6\}, Yvonne getting all of the fruit and Xavier nothing \{X6, Y1\}, Xavier getting two pears and Yvonne getting 1 apple \{X2, Y3\}, and \{X4, Y2\} are all Pareto optimal.\(^9\) Indeed, although Xavier getting 1 apple and Yvonne getting 1 pear \{X5, Y5\} is not Pareto optimal while Xavier getting all the fruit and Yvonne getting nothing \{X1, Y6\} is Pareto optimal.

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\(^9\) Warning. The following two errors are commonly made: (1) If a change makes one person worse off, the new position is not Pareto optimal; and (2) Pareto optimality favors the status quo. These are wrong. In going from \{X1, Y6\} to \{X6, Y1\}, we are going from one Pareto outcome to another. Neither has dominance over the other.
we cannot say that \{X_1, Y_6\} is Pareto superior to \{X_5, Y_5\} as Yvonne would be worse off when she has 1 less pear. Hence Pareto optimality is in general quite useless for making distributional judgments.

To make sure that the concept of Pareto optimality is understood, we will consider the case of three people, X, Y and Z dividing up a cake. Again, everyone is selfish, and there is a possibility that some of the cake is wasted. Consider the following chart where the numbers refer to the fraction of the cake allocated to each person:

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1/3</td>
<td>1/3</td>
<td>1/3</td>
</tr>
<tr>
<td>B</td>
<td>1/2</td>
<td>1/2</td>
<td>0</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>1/2</td>
<td>1/2</td>
</tr>
<tr>
<td>D</td>
<td>1/3</td>
<td>1/3</td>
<td>1/4</td>
</tr>
<tr>
<td>E</td>
<td>1/8</td>
<td>1/4</td>
<td>1/8</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>1/2</td>
<td>1/8</td>
</tr>
</tbody>
</table>

Allocations, A, B and C are all Pareto Optimal. There is no way to redistribute more to one of the three people without redistributing less to one or both of the other two. Allocations D, E and F are not Pareto optimal. Allocation A is Pareto superior to allocation D as Z is better off under allocation A than under allocation D, while X and Y are indifferent between the two allocations. D is Pareto superior to E, while C is Pareto superior to F. Note however that Pareto optimal allocation A is not Pareto superior to the non-optimal (inefficient) allocation F, because Y would be worse off. Similarly, neither B nor C is Pareto superior to D or E.

C. What about distribution?

We have spent a lot of time discussing efficiency in its various guises and no time discussing just theories of distribution (for example, which Pareto optimal outcome is best). In this book (and in the economic analysis of law, more generally) distributional questions are
largely ignored for the following reasons. (1) The prescriptive theory of distribution is undeveloped with little consensus on what is just and with unclear application to the law. (2) Some notions of justice interfere with Pareto Optimality. For example, equality might suggest that X and Y each getting 1/3 of a pie is to be preferred over the less equal distribution where X gets 1/3 and Y gets 1/2. (3) As will be demonstrated in later chapters, in many cases the law is incapable of affecting wealth distribution. (4) In other cases the law is an extremely poor vehicle for doing so. For example, we could choose to make poor drunk drivers not liable when they smash into the cars of the wealthy, but this would be a bizarre method of redistributing from the rich to the poor. It makes much more sense to use the income tax and subsidy system to shift wealth from the rich to the poor if that is what we desire. And (5) certain explanations for just distribution (based on ”natural law” or religious texts, for example) are in fact economic efficiency arguments in disguise. For example, theft is proscribed in the bible on moral grounds. As we will see, the prohibition against theft has an economic efficiency explanation.

D. Concluding Remarks

When the ordinary public thinks of economic efficiency, they think of the evil business owner squeezing the most production out his/her workers even if their work time is made miserable. This is definitely not what economists mean by efficiency (Pareto optimality) because the basic unit of analysis is the welfare of each individual in the society. Similarly, focusing on economic efficiency does not mean that pollution is ignored because, other things being equal, individuals prefer less pollution to more pollution and efficiency is based on individual preferences.

REVIEW QUESTIONS

1. What is the difference between a prescriptive and a descriptive theory? (1)

2. Explain Bentham’s maximization of utilities approach. (6) What are the problems with it? (2)
3. Define precisely: Pareto optimality. (2) Pareto improving move. (2)

4. How can there be many Pareto optimal distributions? Provide an example. (3)

5. Show that if an allocation maximizes the sum of utilities, then it is Pareto optimal. (4)
4. COST-BENEFIT ANALYSIS

In the last chapter, we introduced the concept of Pareto improving outcomes (where at least one person is made better off without making someone worse off). It is a powerful analytic tool, but it is not very practical. Once we get to a large society, it is difficult to make Pareto improving changes. This is because it is impossible to identify and compensate all the losers. To illustrate, consider the situation where a polluting brick factory is forced to reduce its output. Those who like clean air will benefit from the restriction on the factory’s output, while those who intended to build brick patios will be harmed because with fewer bricks available they will either have smaller brick patios or need to reduce their purchases of other items when the price of bricks increases.

Let us play god for the moment and assume that we know everyone’s preferences and that we can find a way for those who benefit from the cleaner air to give up some items (say cans of food or dollar bills) and transfer those items to those who are hurt so that after the transfer everyone is better off than when the factory was polluting. This is a Pareto improving move.

There are two practical problems with such a plan. First, collecting all those items and then redistributing them might cost more than the net benefit of having the factory reduce pollution. In which case, the move to clean air would not be a Pareto improvement. Furthermore, we are not god. It is costly, if not impossible, to discover people’s true preferences. While we may have an idea about the average benefit (or harm) and even some idea about the distribution of benefits

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10 Like many examples in this book, this is derivative of a real case. See Hadacheck v. Sebastian 239 U.S. 394 (1915) where a brick factory was forced to shut down.

11 Usually we think that it is the owner of the brick factory and the workers who are hurt by such a restriction, but the analysis is easier if we think of the final consumers of brick as being the ones who are hurt. Perhaps after the restriction is imposed the brick prices are higher and the new way of producing bricks requires just as much labor for fewer bricks.
and harms it would be very hard to assign the exact benefit or harm to particular individuals. Because a Pareto improvement requires that we tax those who benefit (and possibly tax more those who benefit more) in order to raise sufficient amounts to compensate the losers, we are unlikely to end up with a Pareto improvement because mistakes in measuring individual benefits and costs will be made even if we are correct on average. So we cannot use the Pareto criterion because the Pareto criterion never balances one person’s gains against another person’s losses; rather the Pareto criterion only compares cases where some gain and no one loses.

If we were all clones of each other with identical tastes and abilities, then we could ask any one person whether he/she preferred more clean air and fewer bricks or more bricks and less clean air. Equivalently, we could ask whether the person would pay more for cleaner air or for additional bricks. If the person answered cleaner air, then the value of the cleaner air would compensate this person and all the clones for the loss in value from having fewer bricks. But we are not clones (at least not yet). So we will need to search for other alternatives that allow us to generalize our notion of compensating benefit.

A. Kaldor-Hicks compensation principle

Nicolas Kaldor and John Hicks came up with the following compensation principle: Policy 2 (e.g. restricting pollution) is preferred to policy 1 (e.g., not restricting pollution) if those who gain from policy 2 could hypothetically compensate those who lose in going from policy 1 to 2 so that everyone would be made better off by moving from policy 1 to policy 2. In a nutshell, policy 2 is preferred to policy 1 if it is potentially a Pareto improvement. The losers need not actually be compensated. This is now known as the Kaldor-Hicks compensation test.

It is helpful to consider a simple example. Suppose that you and your friend are deciding which movie to see together. If you want to go see Terminator 14 and your friend wants to see Matrix Reloaded Again, and he is willing to pay you $7.00 to see Matrix instead of Terminator

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12 The hypothetical assumes away the cost of finding and distributing funds to those who need compensation.
and you prefer to have $7.00 in your pocket and watch Matrix over watching Terminator without that $7.00, then the both of you should see Matrix, even if you are not compensated. If both of you went to see Matrix and your friend did pay you $7.00 to do so, then that would be a Pareto improving move over both of you seeing Terminator with no transfer of money between you and your friend. The Kaldor-Hicks compensation principle says that you should see Matrix instead of Terminator, even if you are not paid to see Matrix, because in principle it is a Pareto improving choice.

This test is not without its problems.

First, when there is no compensation, people may lie about their preferences. You say: “I wouldn’t see Matrix if you gave me one million dollars.” And your friend replies: “I wouldn’t see Terminator if you gave me two million dollars.” Below, we will discuss ways of getting around this problem (we uses prices and choices rather than statements).13

Second, we have moved away from the Pareto criterion. Using the Kaldor-Hicks compensation principle, one could recommend policy 2 over policy 1 even though it made someone worse off. Indeed, the Kaldor-Hicks compensation principle would recommend policy 2 over policy 1 even though this meant that a poor man was made a $1,000 poorer if a rich man was made $1,100 richer. Economists have two justifications. First they hope that if we employ the Kaldor-Hicks compensation principle in enough places and certain people are not consistently on the wrong side of the stick, eventually everyone will gain, even if in particular applications some people will lose. Second, economists think that issues of income distribution can be treated separately. If society is concerned that some people are poor, society should redistribute income. Society should not use pollution control as a vehicle for income distribution; for example, not engaging in pollution control because the poor will be hurt is a stupid way of redistributing income to the poor.

13 Even with prices there may be strategic maneuvering. However, cost-benefit analysis usually looks at prices established in competitive markets where such strategic maneuvering is minimized.
The third problem with the Kaldor-Hicks compensation principle is that it may be internally inconsistent (unless we make certain restrictions on preferences). We discuss this problem of inconsistency and its resolution in the following 3 subsections.

**B. The Kaldor-Hicks compensation principle may be inconsistent #**

To illustrate the problem with the Kaldor-Hicks compensation test, let us look at Figure 4:1.

![Figure 4:1 The Kaldor-Hicks criterion may be inconsistent](image)

**THE SET OF PARETO OPTIMAL POINTS ARE ON THE LINE SEGMENT R UNTIL B AND ON THE LINE SEGMENT T UNTIL B.**

The diagram is of necessity cardinal (since distance is cardinal), but we will only be concerned with ordinal relationships. Policy 1 is represented by the steeper downward-sloping line; given policy 1, the line represents the maximum feasible utility combinations. Suppose that policy 1 results in position S (where X gets S utility and Y gets 0 utility), and that policy 2 results
in position Q (where X gets 0 utility and Y gets Q utility). According to the Kaldor-Hicks compensation principle, policy 2 is preferred to policy 1 because with policy 2 society could be at T instead of Q, and both X and Y prefer T to S. That is, Q is preferred to S, because Y could compensate X by moving to T where both would be better off than if they were at S. Remember that this compensation need not take place.

The only problem with this argument is that a parallel argument shows that Policy 1 and distribution S is preferred to policy 2 and distribution Q! According to Kaldor-Hicks, S is better than Q because X could compensate Y by going to position R. At position R, both X and Y are better off than they are at position Q. So policy 1 is preferred to policy 2. We have a complete contradiction. The Kaldor-Hicks criterion and its mirror opposite (known as the Skitovsky test) cannot choose between R and T either.

C. Wealth Maximization #

This contradiction does not arise when the utility tradeoff frontier of one policy is never to the left of the other policy. In Figure, 4:2, policy 2 is always to the right of policy 1. In this case, all of the points on the utility possibility frontier of policy 2 are Pareto optimal (assuming that there are only these two policy possibilities); while none of the points on the utility frontier of policy 1 are. Under such circumstances, we can say that society under policy 2 is unambiguously wealthier than it would be under policy 1. We can also say that outcome Q is unambiguously preferred to outcome S according to the Kaldor-Hicks compensation criterion (as T is preferred to S but not vice versa). However, once you establish that one policy creates greater wealth than another, there is no need to do a separate investigation regarding compensation as a wealthier society always satisfies the Kaldor-Hicks compensation criterion without contradiction (and vice-versa). 14

14 Note that wealth maximization is not equivalent to maximization of gross domestic product (GDP) if certain costs are not measured (such as pollution) or people are forced to produce. This is easily illustrated by considering a one-person Robinson Crusoe economy. By being forced to work 18 hours a day, Robinson Crusoe would produce more but he would be less happy and
We are now left with only one practical problem. We have measured everything in terms of preference or ordinal utility. It would be easier to measure everything in dollars. Measuring wealth in terms of money also makes more intuitive sense. We will now turn to this issue.

If people valued only manna from heaven, then the more manna, regardless of how it was distributed, would be preferred to less manna (as long as people only cared about the amount of manna). Therefore, less wealthy than if he were allowed to work and produce as much as he wanted and chose 8 hours a day, instead. Furthermore, if some of this production yielded a lot of smoke and the cost to Crusoe of this smoke were greater than the benefit of what was being produced (and clean air was not being measured), then Robinson Crusoe would be worse off and therefore less wealthy than if he produced less with less smoke even though measured GDP were higher.
manna they received). The society with more manna would be wealthier. That is, we would have
an unambiguous measure of wealth and Figure 4:2 rather than Figure 4.1 would characterize the
choice between different policies. Society would choose the policy that maximized wealth (in
this case policy 2).

But what if preferences were more complex? Can wealth be defined unambiguously? The
answer is found in the following section.

D. Quasi-linear utility functions #

We have an unambiguous measure of wealth and the Kaldor-Hicks compensation principle
is internally consistent when individual preferences can be characterized by a *quasi-linear utility
function*. When individuals have quasi-linear utility functions, a redistribution of wealth does not
change aggregate consumption and one good, money or manna, can be used as an ordinal
measure of welfare. As noted in the previous section, if people only valued manna, then a society
with more manna could in principle be made Pareto superior to a society with less manna if no
one received less manna in the society with more manna available. With quasi-linear utility,
even though people value many goods, manna can again be used as a consistent measure of
ordinal welfare.

Quasi-linear utility is defined as follows: The utility of the ith person is $U_i = m + f_i(x_1, x_2,
\ldots, x_n)$, where i stands for the ith person, $x_j$ is the jth good or service, and m is numeraire good,
money or manna. Person i's preference ordering over various combinations of n goods is
represented by the function $f_i(x_1, x_2, \ldots, x_n)$. $f_i(x_1, x_2, \ldots, x_n)$ is quite general so that it can
characterize a wide variety of preferences. For example, Xavier’s utility for manna (m), wine (w)
and caviar (c) might be $m + \sqrt{wc}$ while Yvonne’s utility function might be $m + \log(w) + c^{1/3}$.
Notice that in both cases, the person’s utility for manna-money is a linear function of manna-
money and is independent of how much wine and caviar the person consumes and the utility that
a person gets from wine and caviar is independent of how much manna-money the person has.
So this is the key to what is meant by a quasi-linear utility function – there is one good with constant marginal utility that does not depend on how much of the other goods are consumed.

It is not necessary to understand the formula for quasi-linearity. What is important to know is the following. (1) Demand for all goods, except manna-money does not depend on the person’s wealth, only relative prices;\textsuperscript{15} and (2) money (manna) is a consistent measure of value that the person gets from a set of items. With quasi-linear preferences, redistribution of wealth does not alter any individual’s consumption of items $x_i$, it only changes the amount of $m$ that each person consumes – more $m$ for one person is less $m$ for another. Thus when wealth is redistributed aggregate demands do not change.\textsuperscript{16} So prices do not change either. What this means is that we can convert everything into units of manna or money. And once again the more aggregate manna, the wealthier the society.

Going back to Figure 4:2, wealth maximization would recommend that policy 2 be chosen over policy 1, which could mean choosing Q (which allocates 0 to X and Q to Y) over S (which allocates S to X and 0 to Y) even though Q is not Pareto superior to S (as X is made worse off). Of course, wealth maximization and the Kaldor-Hicks compensation principle do not say that losers are never compensated, only that compensation is not necessary.

E. Cost-Benefit Analysis

The Kaldor-Hicks compensation principle is in terms of preferences and utility functions. But we rarely have direct knowledge about other people’s preferences. Fortunately, if people are

\textsuperscript{15} The consumer needs enough manna to be able to purchase the non-manna items.

\textsuperscript{16} Here is a note for those who have a PhD in economics. If individuals have Gorman type preferences, then redistribution does not affect aggregate demand. Alternatively, if individuals have identical homothetic utility functions, aggregate demand will not be affected when there is a redistribution of income. So, quasi-linearity utility functions are not necessary to achieve this result.
rational, we can infer preferences from prices. As was discussed in chapter 2, if a person pays $10 for that last liter of wine, it must be worth $10. If it were worth less, then the person would not have purchased it; if it were worth more, then the person would have purchased even more wine until the last unit of wine was worth $10 per liter (allowing for infinitesimal purchases).

Going back to the brick factory example, suppose that there will be a million fewer bricks produced each year if the factory is forced to reduce its output. Suppose further that the amount of particulants released into the air will be reduced by a 100 million per year. If the price of a brick is less than (or equal to) 100 times the cost of a particulant, then the benefit of forcing the brick factory to reduce its output will exceed or equal the cost. Otherwise, the cost of forcing the brick factory to reduce its output will exceed the benefit.

So this is the basic idea behind cost-benefit analysis. If the benefit is greater than the cost, then one should undertake the activity. It is just a generalization of individual choice to the level of society. Furthermore, when benefits outweigh the costs, in principle, the winners could compensate the losers. Thus the Kaldor-Hicks criterion is also satisfied.

However, measuring benefits and costs is not a trivial exercise. We need to answer two questions. The first question is how do we establish a price for clean air (reducing particulants). After all, we do not see people purchasing clean air like they purchase cans of soda. The basic method of establishing the price of clean air is to use _hedonic pricing_. For example, observing how much more people pay for a house in a clean-air area over the identical house in an area with dirty air. The present value of clean air is reflected in the higher price for the house in the clean-air location.

The second question is how does one deal with changing prices? The more of a good, the lower the marginal benefit of the last unit is likely to be, and the lower the price consumers are willing to pay. That is, demand curves are generally downward sloping rather than being perfectly horizontal. So if there is more clean air, we can no longer talk about the price of clean air; instead, we have to consider the demand curve. We deal at length with this issue in the following section.
F. Downward sloping demand curves and quasi-linear utility #

If people have quasi-linear utility functions, then the benefit that they receive from consuming a certain amount of a good is the area under the relevant portion of the demand curve. To illustrate, we start with a general demand curve (see Figure 4:3A). A demand curve is the amount demanded for a given price. To repeat what I said earlier, if a person will purchase one item when the price is $10, then that means that the person valued the first item at $10 and no more or no less. If the person valued the item at more than $10, then the person would have purchased the item at a higher price; if the person valued the item at less than $10, then the person would not have purchased the item for $10. Because it is easier to illustrate with discreet units, let us switch over to Figure 4:3B, where the possible quantities are 1, 2 or 3. This demand curve shows that the person is willing to buy 1 unit when the price is $10 and that the person is willing to pay $8 each for two items. Now suppose that this is the demand curve of a person with a quasi-linear utility function. Quasi-linear utility allows us to make an addition inference -- that the person would be willing to pay $8 for the second item even if the person paid $10 instead of $8 for the first. The reason is that with quasi-linear utility, wealth has no effect on demand, only relative prices. By paying $2 more for the first item, the person is less wealthy than if the person had paid $8 for the first item. But a change in wealth does not affect a person’s demand (marginal valuation or benefit) for the second item when the person’s utility is quasi-linear. Hence with quasi-linear preferences, we can measure the area under the demand curve until $Q^*$ as the individual’s benefit (in terms of dollars) from having $Q^*$ instead of 0 units (of clean air, for example). The argument has been made in terms of an individual demand, but market demand is just the sum of individual demands. So the same argument holds for market demand curves. When utility functions are quasi-linear, we can measure the benefit of a policy as the area under the relevant portion of the demand curve. The same holds for the supply or marginal cost curve, where total cost is the area under the relevant portion of the supply curve.

We have already shown (in subsection D) that with quasi-linear utility functions, prices will not change when the distribution of income changes. Hence, whether those who benefit
compensate those who are harmed, the cost-benefit calculations (areas under the demand and supply curves) are the same.

Quasi-linearity means that cost-benefit calculations yield the same policy prescriptions as the Kaldor-Hicks compensation principle and wealth maximization – all three are interchangeable. In the remainder of the book, we will stick to cost-benefit calculations since we observe prices rather than preferences and it is easier to make the cost benefit-calculations than to calculate total wealth. And getting back to Pareto optimality and efficiency, if we have maximized wealth (equivalently, we are at a point where there are no alternative policies such that the benefits of these alternative polices outweigh the costs), then we are at Pareto Optimal point and the outcome is efficient.

What happens if preferences cannot be characterized by quasi-linear preferences? In the absence of quasi-linear utility, measuring the area under the demand curve provides an inaccurate measure of benefits. However, it may be a reasonable approximation. Another way to justify the use of cost-benefit analysis in the absence of quasi-linear utility functions is that many decisions have insignificant effects on prices. For example, forcing a city brick factory to reduce output may have a negligible influence on brick prices if there are many brick factories located in many different areas so that most are not affected by the policy decision. Furthermore, even in the absence of quasi-linear utility, many policies have only minor second-order affects. When those who like clean air have to compensate those who like brick patios, the former are somewhat poorer and the latter are somewhat richer, but this change in wealth is unlikely to have any significant change in demand for any one good.18

17 For the argument, see Willig (1976).

18 Our discussion has been in terms of *general equilibrium* (all markets are considered simultaneously), but both cost-benefit calculations and supply and demand curve analysis are typically done within a *partial equilibrium* framework where at most one only one good is being considered at a time and at most one price is changing.
FIGURE 4:3

A

PRICE

DEMAND

QUANTITY

B

1 2 Q*

10 8 6

D
To be more consistent with the economics of law literature, we will usually avoid the term “quasi-linearity utility.” Instead we will tend to use the following expression: “we will assume that a redistribution of wealth does not change the relevant consumer choices” except for manna-money. Of course, the quasi-linearity implies the expression in quotes. And to reiterate what was said earlier, this assumption need not hold completely since we are mainly interested in the issue at hand. We really don’t care all that much whether a farmer buys fewer clothes if he rather than the neighboring rancher has to pay for a fence; instead we are interested in whether the fence will still be built if the farmer has to pay for the it.

G. Concluding Remarks

In general, we will use the word efficient as being interchangeable with Pareto optimality, wealth maximization and maximizing benefits minus costs. The only time these words are not interchangeable is when wealth is not well defined (as might arise when preferences are not characterized by quasi-linearity utility), in which case we will explicitly deal with Pareto optimality.

Recall the following chart first presented in the last chapter. A, B and C are all Pareto optimal allocations. While D, E and F are not Pareto optimal. Note that Pareto optimal allocation B is not Pareto superior to D. Consequently, the Pareto criterion could make no recommendation in choosing between B and D. However, cost-benefit analysis does. It says that B is superior to D because the benefit to X and Y is greater than the cost to Z in moving from D to B, and in principle Z could be compensated by X and Y so that all three were better off. The same logic holds in going from E or F to A, B or C.
In this chapter we have undertaken a detailed argument justifying cost-benefit analysis. For the remainder of the book, cost-benefit analysis will be the underlying rationale for determining the appropriateness of legal rules.

REVIEW QUESTIONS

1. Why is a Pareto improvement not a good guide for actual policy prescription?

2. What is the Kaldor-Hicks compensation test? (4)

3. What is meant by wealth maximization? (4)

4. What is cost-benefit analysis? (4)

5. How does one measure the value of clean air? (2)

6. How is Kaldor-Hicks compensation test employed in cost-benefit analysis? (2)

REFERENCES

B. TRANSACTION COSTS AND THE COASEAN REVOLUTION

The concept of transaction costs is critical for our understanding of law and organization. Consider the following seemingly unrelated questions: When do we have franchising instead of independent firms? What is the effect of contract law? Does making the owner of a neighboring property liable for damage from his trees falling on your property reduce the damage in comparison to the situation where you are liable? The answers to these and many of the other questions raised and answered in this book all depend on the level and nature of the transaction cost.

So what are transaction costs and why do they make a difference? In Chapter 5, we define transaction costs. In a nutshell, they are the cost of coming to an agreement and enforcing the agreement. Chapter 5 details the circumstances under which transaction costs tend to be high or low. When market transaction costs are high, the choice of legal regime (e.g., which party is liable for damage) is very important, as the parties will not be able to transact around the initial allocation of entitlements. An example is automobile accidents where the legal regime is critical (a negligence rule will result in different levels of care undertaken by drivers than a strict liability rule).

When transaction costs are low, the choice of legal regime is irrelevant regarding the level of care undertaken by the parties. This result is known as the Coase theorem. The logic is covered in Chapter 6.

In Chapter 7, we consider the Coasean analysis in greater detail. One of Coase’s important ideas was to see the essential symmetry between the party that harms (e.g., the polluter) and the party that is being harmed (e.g., the pollutee). Both are inputs into the production of the harm and thus the burden of the solution need not fall on one party – the optimal method of reducing damage from pollution might be for the victim–pollutee to move away rather than for the polluter to install smoke filters.
So what about the questions raised at the beginning of this section? Not all of them will be answered in this section. As already suggested, transaction cost analysis lies at the very heart of this book. This section provides the necessary framework. Still we can provide a quick summary to the questions posed. Firms try to economize on transaction costs. Under certain circumstances, the franchise arrangement reduces transaction costs over other forms of organization such as single ownership of all of the outlets or independent ownership of the outlets (see chapter 36). In general, contracts involve low transaction costs; so court rulings have little effect on the nature of the contract (see chapter 22). A parallel example to the falling tree example is found in chapter 6.

The reason why this section is called the Coasean revolution is that Ronald Coase is responsible for most of the insights. He is the person who emphasized the role of transaction costs in explaining the theory of the firm – firms and markets are organized to economize on transaction costs. He is also responsible for the Coase theorem and its opposite (when transaction costs are high, the choice of legal regime is very important). And as already noted he emphasized the symmetry between the parties. This is why he won a Nobel Prize in economics and why I label this section “the Coasean revolution.”
5. TRANSACTION COSTS

A rancher's cows stray onto the neighboring farmer's land where the cows trample the farmers' corn. If the rancher is liable for the damage to the farmer will there be less damage to the farmer’s corn than if the rancher is not liable?

This question was raised and answered in Ronald Coase's Nobel-prize winning article, "The Problem of Social Cost," *Journal of Law and Economics* (1960). The article is so fundamental that we will take 3 chapters to explain it in full. Although the economic analysis of law has roots as far back as the late 18th century, this article introduced many of the fundamental building blocks of analysis, including what has now become known as the Coase Theorem.

**COASE THEOREM:** If there are zero transactions costs and mutually beneficial trades are always made when transaction costs are low, then, whatever the initial assignment of entitlements, (a) the outcome will be efficient, and (b) the outcome will be the same when changes in the distribution of wealth do not affect consumption patterns.19

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19 This statement of the theorem is somewhat different from the standard. The standard statement of the “theorem” is not a theorem, but a conjecture – that low transaction costs will lead to efficient bargains. The only way for the standard statement to not be a conjecture is either (1) to make it tautological by assuming that any failure to reach a settlement is due to high transaction cost, or (b) to assume that there are high transaction costs whenever one side does not know what the other side will accept in the bargain. Assumption (b) is fine, but I find it, more convenient to deal with my version of the theorem.

Initial means that the entitlement is assigned before (or independent of) behavior. If one obtained the entitlement by behavior (e.g., by building a house one obtained the right to have no shadows cast on the land), then the assignment of entitlements would affect the outcome. For a more in depth discussion of how changes in wealth might or might not affect consumption patterns, see the sections on quasi-linear utility in chapter 4.
The Coase theorem is quite a mouthful and difficult to digest in one sitting. Indeed, when Coase first presented his theory to a group of economists (including 2 future Nobel-prize winners) at the University of Chicago, it took him two hours before the group accepted his argument. So don’t feel bad if you either do not understand or agree with the statement of the theorem on an initial reading.

A. Transaction Costs

Before trying to make sense of the theorem, it is important that we first understand what is meant by transaction costs.

Transaction costs are the costs of making and enforcing the transaction or exchange of entitlements. Haggling, waiting in line, carrying out threats (such as strikes and fire bombing), having the issue arbitrated, inspection of goods being traded to insure that the seller has been honest, all have economic costs to society as a whole since scarce resources are being used up for the transaction. These scarce resources could be used in some other activity—this is the notion of opportunity cost. Note that purchasing an item for X dollars does not involve a cost to society of X dollars as the X dollars are merely transferred from one person to another. Only the time involved in actually exchanging the money (along with the other costs in coming to an agreement) is a transaction cost. For example, when you purchase a loaf of bread from a grocery store, the time cost of waiting in the checkout line and the salary for the cashier is the transaction cost.

What conditions foster high market transaction costs? 20 1) Negotiation costs arising from the combination of bilateral monopoly with many participants on both sides. 2) The cost of

20 Here we are discussing market transaction costs. There are non-market transaction costs such as the cost of going to trial. We will deal with these costs in later chapters.
monitoring and enforcing the agreement, as well as the cost incurred when one or both parties try to renege on the agreement.

1. Negotiation Costs

To illustrate negotiation costs, assume that I have the Hope diamond and you have Da Vinci's "Last Supper." I really want the Last Supper (LS) and would be willing to exchange my Hope Diamond (HD) and one million dollars for it. You really want the 45.52 carat Hope diamond and would be willing to give up the Last Supper for it. This is a bilateral monopoly. Each has what the other wants, but there are no terms of trade to establish what the exchange rate should be. Is it LS for HD or LS for HD + 1 million dollars. Clearly, I prefer the former and you prefer the latter. We may bargain for somewhere in between. It may take several years of intermittent negotiations to come to an agreement. Other examples of bilateral monopoly are management and unionized workers, and Israel and Palestine control over their common border, wherever that may be.

Compare bilateral monopoly to a case of perfect competition. I have a bushel of wheat and you have 2 bushels of rice. Assume that wheat sells for twice the price of rice on the open market. If I want more than two bushels of rice for my bushel of wheat, you will purchase your wheat elsewhere; if you want more than a bushel of wheat for your two bushels of rice, I will purchase my rice elsewhere. There is no haggling as neither can get better terms of trade since the market price is uniquely defined due to the fact that there are so many perfect substitutes. But the painting "Next to the Last Supper" by Donald Wittman is not a very good substitute for Da Vinci's "The Last Supper" nor is the "Hopeless Zirconium" a good substitute for the Hope Diamond.

Another way to characterize the difference between bilateral monopoly and perfect competition is in terms of the information that each side has about the other. When there is a well-established price for both goods as would be the case when both goods are competitively supplied, then each side knows what price the other side will accept in the exchange. So there is no need to bargain. But when the price that the other side will accept is unknown, as would be
the case when there is bilateral monopoly, there may be more haggling as each side tries to get the best deal possible and sometimes Pareto improving trades will not take place. This problem of asymmetric information will be discussed in greater detail in later chapters (see for example, chapter 27 on insurance and chapter 39 on bargaining in the shadow of the law).

If more than two people are involved and a unanimous agreement is required, then bargaining costs increase dramatically and the likelihood of a successful agreement falls toward zero. To illustrate, consider the case where the state wants to build a freeway from the town of Los Gatos to the city of Mountain View. To make the analysis as easy as possible, suppose that the state is willing to pay up to a total of $300,000,000 for the 100 parcels of land that the freeway will cross. Assume further that each property owner would ordinarily be willing to sell the property for one million dollars. Thus the surplus value of this project is $200,000,000 (300 – 100 * 1 = 200). If the state has to purchase these parcels on the open market, then each of the 100 owners will try to extract the full surplus for herself. Each parcel owner is a monopolist. Without her consent, the freeway cannot be built – the freeway cannot dead-end at one parcel and start anew two parcels down. So each landowner will try to extort the surplus of $200,000,000 (in addition to the 1 million dollars it is worth to the landowner). It pays each landowner to be more intransigent than the rest, hoping that the other landowners will give in to a lower share of the surplus. For example, landowner 1 might say to the other landowners: “I will accept nothing less than $200,000,000. You, the remaining 99 landowners can share $100,000,000, which will make each of you better off than if the freeway is not built. Therefore you should acquiesce to my selfish demands because if you don’t, there will be no freeway and you will be worse off.” Of course, the temptation is for all of the landowners to try to extract more than their fair share, so the total demanded by the landowners could well exceed the amount the state is willing to pay. Indeed the amount demanded could go as high as 20 billion dollars (100* 200,000,000). Compare this to the situation where one person owned all the parcels – so we have a single monopolist. Knowing that the state was only willing to pay at most three hundred million dollars, the person would not try to bargain for anything more. So an agreement would be much more likely.
Because a market failure is so likely in this case, governments (including capitalist governments) do not rely on the market when acquiring land for streets and highways. Instead, they force the landowners to sell by the rule of *eminent domain* and then compensate the landowners for “fair market value.” Needless to say, fair market value is not determined by the landowners; instead, a third party (e.g., a judge) decides what is a fair price. In contrast, if the government wants to build a post office, it does not use eminent domain; instead the government buys the land like any other purchaser because the multiple monopoly-holdout problem does not exist in this situation.

The *monopoly holdout* problem arises whenever unanimous agreement is needed. To hammer home the idea, I will consider one more example. Suppose that homeowners have the right to not have pollution, but they can sell this right to a factory that would like to engage in a highly profitable but pollution intensive activity. Suppose further that the benefit to the factory owner is greater than the true cost to all of the homeowners. If unanimous agreement by the homeowners is needed for any agreement, then each homeowner will be in a monopoly position; if one homeowner does not agree, then no agreement can be made. Again, each owner will try to be a *monopoly holdout* and try to extract the surplus for herself. So the total amount demanded will be far greater the benefit of engaging in the pollution producing activity, which we have assumed is greater than the total cost to the homeowners. And so the high transaction costs of bargaining in this case will likely prevent a Pareto improving outcome. Indeed the likelihood of a sale of this property right to no pollution is so low, that it generally is not saleable in the first place.

The mirror image of the monopoly holdout problem is the *free-rider* problem. Suppose that a factory is located near a housing development and that each homeowner prefers that the factory

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21 Note that there are some court transaction costs involved in determining the fair market price, but in this case they are small in comparison to market transaction costs.

22 For similar reasons, collective decisions rarely require unanimity. For example, zoning rules (for cities) and restrictive covenants (for developments) are typically determined by a majority or a 2/3 rule with equal treatment of all instead of unanimous consent and a market system.
close down. Suppose that the benefit to each of the 1,000 homeowners from closing the factory is $750 so that the total benefit to the homeowners from the factory closure is $750,000. Suppose further that the cost to the factory owners from closing the factory is $500,000. If the factory has the right to be there, then even if in principle the homeowners could buy the right from the factory owners, under a system of voluntary transactions, they probably won't. Each homeowner would be better off by paying $600 and having the factory shut down, but each homeowner would be still better off if her neighbors paid enough to bribe the factory to shut down and she did not. In this way, she would have a free ride. Since most (if not all) homeowners are likely to think this way, an inadequate number of homeowners would voluntarily contribute to the closure of the factory.

The problem of free-riding explains why economic markets are not used in many circumstances, even within capitalist systems. For example, almost all of the citizens benefit from national defense. So if the money for defense were raised through cookie sales and collection boxes, there would be a temptation to free ride on others’ contributions. The amount collected would be insufficient – everyone would be better off if they were forced to pay for defense than relying on voluntary contributions.

2. Monitoring, Enforcement and Avoidance Costs

In the typical economic textbook, a market exchange is a simple transaction (e.g., a farmer sells a bushel of wheat for $2.00). However many exchange relationships are much more complex (e.g., employment contracts, defense contracts or the settlement of the dispute between Israel and the Palestinians). Not only are the negotiations involved in establishing such contracts quite complex and time consuming (read high in negotiation transaction costs), but also there are costs of monitoring and enforcing the contracts. That is, costs are involved in making sure that the exchange has taken place according to the agreement. These transaction costs clearly vary according to the complexity of the item being exchanged. Purchasing #2 Durham wheat requires less monitoring than buying a star-wars weapon system from a defense contractor or verifying that an arms-control agreement has been honored by the other side. The level of the monitoring costs can also be affected by which particular entitlements are exchanged. Thus putting a door-
to-door salesman on commission instead of paying hourly wages clearly reduces the need to monitor the amount of time a salesman puts into his job. Under a pure commission system, the salesman does not sell his entitlement to establishing his own work time, because the cost of his employer monitoring the agreement if he did so would be too high. On the other hand, sales people in department stores are often supervised (monitored) to make sure that they do not take excessive lunch breaks and that they come to work in the first place.

Monitoring is needed because people may try to avoid fulfilling their end of the bargain. The owner of a car may claim that it is has never been driven, and the purchaser may check the speedometer. But if the seller has run the car in reverse while the car is raised off the ground, the seller may be able get away with claiming that a car with 900 miles has only been driven 9 miles. In this example, the cost of the gas used in running the car in reverse is also a transaction cost. There are many interesting issues that arise because of such opportunistic behavior and we will return to them later.

B. An Intuitive Example

It is easiest to understand the Coase theorem, if we first paraphrase it without the qualifiers, next illustrate it with a simple example, and finally consider the qualifications. So here is the imprecise but easier to grasp paraphrase: when transaction costs are low, the final allocation of entitlements is independent of the original allocation of entitlements. Now, for the simple, but easy to grasp, example.

Suppose that I have a ringside ticket to a boxing match, but I don’t like boxing. Consider the following three scenarios: (1) I sell the ticket to the highest bidder in my class, Arnold. (2) I give the ticket to Arnold. And (3) I give the ticket to Hillary. In the first scenario, Arnold was willing to pay the most for the ticket. I had the original entitlement, but he ended up with the ticket. In the second, case the ticket is allocated to Arnold. Under the circumstances, it seems extremely unlikely that a bargain could be struck whereby another student paid Arnold to give up the ticket. In the third scenario, Hillary is likely to sell the ticket to Arnold since we already know from the first scenario that Arnold is willing to outbid everyone else for the ticket.
In this example, whatever the original entitlement, Arnold ends up with the ticket. So this illustrates part B of the Coase theorem -- when transaction costs are zero, the final allocation is the same regardless of the initial allocation. Furthermore, the final allocation is wealth maximizing – the item goes to the person who is willing to pay the most for it. So part A of the theorem holds as well – the outcome is Pareto optimal. Of course, Arnold prefers the second scenario where he is given the ticket, rather than paying for it; and Hillary prefers the third scenario where Arnold pays her for the ticket.

C. Some subtleties

The previous subsection provides the essence of the Coase theorem without the distracting conditional statements found in the formal statement of the theorem. It is this essence, which needs to be first mastered. Nevertheless, there are some subtleties that need to be considered.

The first issue to consider is how the individuals involved change their spending patterns when their wealth changes due to a change in their entitlements (e.g., changing from scenario 2 where Arnold is given the ticket to scenario 3 where Arnold pays Hilsary for the ticket). If changes in the distribution of wealth do not affect consumption patterns (in technical terms, individuals have quasi-linear utility functions), then, under the second scenario, Arnold will consume more manna and Hilsary less (by an equivalent amount) than under the third scenario. All of their other purchases remain the same. Therefore “the outcome is the same” regardless of the initial allocation of entitlements. A redistribution of wealth via a change in entitlements does not change the final outcome.

Now if, contrary to the assumption in part B of the theorem, consumption patterns change when wealth is redistributed, it is possible that Hilsary will buy fewer bottles of wine and boxes of chocolate when she has less wealth (scenario 2 instead of scenario 3) and Arnold will buy more cigars and oysters when he has more wealth (scenario 2 instead of scenario 3). So some things might change when the entitlements change (so that there is a redistribution of wealth), but who ends up with the boxing tickets does not change. Focusing on the issue of who ends up with the
tickets, the final outcome does not change in this case, as well (even though we are speaking more loosely).

When people are wealthier, their spending patterns may change (if they do not have quasi-linear utility functions). When the ticket is given to Hillary (scenario 3), she is wealthier than under scenarios 1 and 2. It is conceivable that this increase in wealth means that she is willing to spend more on seeing a boxing match, possibly enough more that she would no longer be willing to sell the ticket to Arnold at a price he was willing to pay. To illustrate, suppose that Hillary has $100 a month to spend on entertainment and she is only willing to spend $40 on a boxing match. Then Arnold, who is willing to spend $70, would not sell the ticket to Hillary in scenario 2 (nor would Hillary outbid Arnold in scenario 1). In scenario 3, Hillary gets the ticket for nothing. Therefore she can spend $100 on other entertainment and still see the boxing match. Hillary might prefer to spend $80 on a boxing match and $90 on other entertainment rather than spend all of the $170 on non-pugilistic entertainment. If Arnold offered her $70 for the ticket, she would not sell it to him because if she had $170, Hillary would then be willing to pay $80 for the boxing ticket.\(^{23}\) In this example, a change in the initial distribution of entitlements does change the final distribution of entitlements. If Hilary is given the ticket, she will end up with the ticket; if Arnold is given the ticket, Arnold will end up with the ticket. In this case, a change in the distribution of entitlements does affect demand sufficiently so that the relevant outcome does change. The wealth-maximizing outcome is no longer well-defined since the outcome depends critically on the initial allocation of entitlements. However, all scenarios are still Pareto optimal, since there is no way to make one person better off without making another worse off. So part A of the Coase theorem still holds even though part B does not in this last example.

In most of the cases that we consider in this book, changing the initial ownership of the entitlement does not alter the demand for the entitlement, especially so when we are discussing the interaction of two firms where profits rather than tastes are the motivating force (as

\(^{23}\) Another way of looking at this situation is to assume that I gave Hillary $70 before I auctioned off the tickets. She would then be willing to bid more than $70 for the tickets. Therefore, Hillary would outbid Arnold in scenario 1 and end up with the ticket in scenario 2.
illustrated in the farmer-rancher example discussed in the next chapter). So in most of the cases considered in this book, part B of the Coase theorem holds when part A does.

We next delve more deeply into the assumption that “mutually beneficial trades are always made when transaction costs are low.” It is useful to consider the third scenario in more detail. I have argued that Arnold will end up buying the ticket from Hillary (if the tickets are worth more to Arnold). But such negotiations may be time consuming since Hilary wants to sell high and Arnold wants to sell low. There is an opportunity cost in such negotiations; perhaps Arnold and Hillary are spending less time studying. Furthermore, if both bargain too hard, the transaction may not take place. That is, our assumption that mutually benefiting trades always take place when there are low transaction costs may not hold (and as a consequence, part A of the Coase theorem, that the outcome is always efficient, will not hold either). We will come back to this last point in a later chapter.

Because bargaining is not costless and Pareto improving outcomes may not be negotiated, we might want to allocate the tickets to Arnold in the first place if we knew that he valued the tickets the most. In this way, an efficient outcome would be guaranteed and transaction costs would be less than otherwise.24

D. Concluding Remarks

We have shown that the transaction costs involved in negotiating and monitoring agreements need not be trivial, and that when either a unanimous agreement is required or free-riding is possible, market transaction costs are likely to be extremely high.

24 Other things being equal, people with more money are capable of bidding more for the ticket. Hence the wealth maximization criterion suggests that, other things being equal, we should give the ticket to the rich person if it is a luxury item. In economic analysis of law, wealth maximization deals with issues where the effect of income on willingness to pay is relatively unimportant so that we do not get such odd results. For example, whatever, the distribution of income, societies will probably want to discourage drunk driving.
In this chapter, we have concentrated on market transaction costs. But, as will be seen in later chapters, there are also transaction costs within non-market settings. For example, a law limiting vehicular emissions includes the following transactions costs: lobbying by outside groups, bargaining within the legislature, enforcement by regulatory agencies, and the cost of going to court when the law or its application is in dispute.

**HIGH TRANSACTION COST AND THE LAW**

Suppose you are on the side of the road bleeding to death and a doctor comes along. You could bargain about the price of his services (if you were conscious), but by the time you came to an agreement you might be dead. The law “cuts to the chase” by requiring the doctor to make his customary charge for such services. He cannot charge you more even if you agreed to it at the time. For similar reasons, admiralty law provides guidelines for salvaging a sinking ship. No use dickering while the water is up to your neck.

**SUGGESTIONS FOR FURTHER READING**

It is worthwhile to read Coase’s original article on social cost. For an exhaustive coverage of the Coase theorem, see Medema and Zerbe (2000).

**REVIEW QUESTIONS**

1. Define transaction costs (2)
   Under what circumstances are market transaction costs low? (2)
   Under what circumstances are market transaction costs high? Provide examples. (3)
2. When do monopoly holdouts occur? (2) Explain why monopoly holdouts create high market transaction costs. (3)

3. When do free-riders arise? (2) Explain why free-riders create high market transaction costs. (3)

4. Suppose that in bidding for a ticket, Arnold has the highest bid. Suppose instead that the ticket was given to Arnold. Explain why Hillary would be unlikely to buy the ticket from Arnold. (2) Suppose that the ticket was given to Hillary instead. Explain why it is likely that Arnold would buy the ticket from Hillary. (2) Provide a transaction cost reason and a redistribution of wealth reason in explaining why Hillary might not sell the ticket to Arnold in this last case. (4)

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