

A STUDY IN PROPERTY RIGHTS

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1. Introduction — The Laws of Economic Motion

The normal breakdown of economics is into *micro* and *macro*. Microeconomics deals with individual decision making and aggregates this into market supply and demand. Microeconomics is useful in understanding industry price and output. Macroeconomics deal with aggregating supply and demand across markets into economy wide forces. Here the study focuses on questions like unemployment, inflation, and the distribution of income.

The study of contracts involves a somewhat different study. It starts with individual decision making as in the micro view. However, instead of aggregating behavior into market supply and demand forces, it looks at the individual relationships between buyers and sellers in specific transactions. Only rarely do individual buyers aggregate their demands and present these to the aggregated supply of sellers. Most commonly, transactions are carried out one buyer on one seller. While the interaction of these two is observed by the other participants in the market and vice versa, at the moment of exchange there are only two participants. At this point there is uncertainty about the precise terms of the contract. Will one party or the other try to “pull a fast one?”

The problems that arise at this point of transaction are our focus. Parties to every contract are interested in structuring the contract to protect themselves from the unfortunate prospect of being had. They set up rules, like the hand motions used by traders in the pits of the Chicago Board of Trade. They require the other party to be bonded, to put up earnest money, or provide samples. Some contracts are never reached. All of these are costs. The costs of contracting. They are sometimes called transactions costs, contracting costs, agency costs, or the costs of property rights enforcement.

Some times this study is called property rights. The economics of property rights is a loosely defined area of research. Obviously, there is the question of the exploitation of natural resources and the property right structures that have evolved to control this economic activity, but if this were all there was, it would be somewhat dull. However, on close inspection, every market transaction involves the definition of property rights. As Barzel says, every time you buy something it is crucially important that you know and can be sure about exactly what you are buying. The contractual provisions that control market exchanges essentially define the market and thereby define the rights in property that are exchanged.

Looked at in this way, we begin our study of the economics of property rights with an overview of the nature of the firm. While it may seem odd to begin the study of property rights with an investigation of the firm, it will quickly become clear why this is the most logical starting point. The firm is a property rights institution. While the neoclassical analysis of the firm treats it as an autonomous economic agent—a living and breathing thing—it is not that at all. The firm is a nexus of contracts, to use Jensen and Meckling’s phrase. The firm is an entity defined by a very

elaborate set of contractual (i.e., property rights) arrangements. When we can understand why the firm exists and where its limits are found, we begin to understand the problem of property rights.

Four Principles Beginning with the Law of Demand

Before we begin our analysis of contracting, let's review the basic theorems of economics and finance. They are:

1. The Law of Demand
2. The Law of One Price
3. The Law of Efficient Markets
4. The Law of Efficient Asset Pricing

Demand is the relation between consumption of a good and its price. This relation is always negative. Empirically this is without question. When price goes up consumption falls. While there may be some dispute about whether crack cocaine users have downward sloping demands or, alternatively, will pay any price for another hit, there is no doubt that the average businessman is constrained by demand. If he raises his price, fewer people will buy his goods. How do we know? Because if he could raise his price and sell more, he would certainly do it. This is not to say that the theoretical question of when and where demand might be positively sloped is uninteresting. Even so, that question is left to other classes. Those inquiries have led to a fuller understanding of the nature of demand and teach us to look for the *ceteris paribus* factors that make demand slope down.

The Law of Demand holds subject to certain conditions: Income, the price of other goods, and tastes. Tastes and preferences are assumed to not change. That is, when consumption changes, we look for the economic conditions that might have caused the change. If none are to be found, then we may be forced to reluctantly conclude that tastes have changed. Normally, when income increases the quantity demanded at each price increases. Sometimes the opposite occurs; we call goods that behave in this perverse way inferior. Normally, when the price of other goods go up, demand for the good whose price stays constant increases. In this case the good is called a substitute. There are goods that behave in the opposite fashion. These goods are called complements. For complements, when the price of one goes up, the quantity demanded of the other falls.

Individuals have downward sloping demands as well as markets. Some individuals have very steep and large demands. Others have flat, small demands. Steep, big demand is called relatively inelastic. This means that as price goes up, the amount that the consumer cuts back is small. On the other hand, relatively elastic demand (flat and small) means that a small increase in price will substantially reduce consumption. The more substitutes available for a given product, the more elastic is the demand.

A revealing way to think about the Law of Demand is in terms of relative prices. When the relative price of a good goes up, the relative consumption of the good goes down. A good experiment is formed when government imposes a per unit tax on two commodities. Take, for example, beer. If the unit tax on beer is raised from \$.10 per can to \$.15, the price of Budweiser goes from \$.50 to

\$.55 while the price of Busch goes from \$.40 to \$.45. This makes the relative price of Budweiser to Busch go from 1.25 ($=.5/.4$) to 1.222 ($=.55/.45$). The prediction is that the relative consumption of Budweiser compared to Busch will go up. This principle is called the *Alchian & Allen Theorem*. It explains a diversity of things like why people eat in nicer restaurants when they go on vacation than they do when they eat out in their home towns and why nicer homes are built on nicer lots.

While the Law of Demand is almost transparent in its simplest form, it is important to understand it in a more complex fashion. Demand is the basis of pricing. Firms are interested in correctly pricing their products so as to maximize revenues for any given level of production. An Atlanta hotel with 200 rooms wants to know how many to sell at discount prices and how many to price at full rates. The same is true for airlines. Intel spends money to make its computer chips work slower in order to be able to sell the faster ones for more money. Hardback books come out before the paperback version. Movies are shown at the theater before they are distributed to video stores. Golf courses like the one at Clemson charge two sets of prices.¹ All of these are examples of *differentiation* between demanders.

Firms want to find a way to get the relatively inelastic buyers to pay more for their product while they charge the relatively elastic buyers less. This is called *price discrimination*. There are two main problems the firm faces in achieving this goal. One is the ability to limit competitors. The other is stopping the elastic buyers from buying at a low price and reselling at a higher price to the inelastic demanders.

The Law of 1 Price

In a competitive market, sellers are unable to achieve price discrimination because of both of the obstacles noted above. In this situation, price is determined by the intersection of Demand and Supply.

Supply is a function that identifies the quantity that will be brought to the market by producers and stockpilers. Generally, as price increases, more will be brought to market.

At the intersection of supply and demand, quantity demanded equals quantity supplied. If price is below its equilibrium value, the quantity demanded exceeds the quantity supplied and the excess of buyers bid the price up. If price is above the equilibrium, the quantity supplied exceeds the amount demanded. The glut on the market forces suppliers to cut prices. In other words, when price is different from its equilibrium value, competition drives in back.

For instance, when there is excess demand, buyers compete with one another. Sometimes the competition among buyers does not take the form of increasing the money price of the good. This usually happens when government is involved in the distribution. Take the case of queuing to allocate football tickets to students. Competition among buyers for the best tickets causes the waiting line. The line is longer for the best games and shortest for the worst. The line generally has the same people at the front.

¹ There are member rates and non-member rates. Members typically pay an initiation fee, monthly dues, and a small per-round price. Non-members pay a higher price per round, but no other fees.

The Law of One Price is built on the idea that competition cannot bear to see an unexploited profit opportunity. If goods of a similar nature are selling at very different prices, a profit opportunity exists in arbitrating this differential. If Nike tennis shoes are selling for \$100 in Clemson and \$50 in Atlanta, a profit opportunity exists in buying a truck load in Atlanta and bring them to Clemson. The market smells out all such profit possibilities and capitalizes on them.

At the intersection of demand and supply, there are a lot of buyers (and sellers) who would have been willing to pay a lot more than they had to for the good. Competition protected them. For instance, I really like coffee. I would be willing to spend more on coffee than I do now, for fewer cups, if forced to. However, the price of coffee is determined by substantial competitive supply among several countries and individual suppliers in those countries and by millions of demanders. Many of the demanders find coffee to be at best an occasional substitute for tea (the British) or Pepsi (my former secretary). Because the sellers can't tell me from my secretary in terms of coffee, I pay the low price at which she values coffee. I am protected by competition.

The Law of Efficient Markets

Market forces search out all unexploited profit opportunities and in most circumstances this creates an efficiency. Competition protects the relatively inelastic demanders. In doing so, it creates *consumers' surplus*. This surplus is graphically depicted as the area above market price and under the demand curve. The mirror image is producers' surplus, the area below market price and above supply. This area of surplus is called the *gains-from-trade*. Competition maximizes the gains from trade because it equates the marginal value of consumption with the marginal cost of production.²

The best way to consider the gains from trade to see what happens when it is lost. Consider the case of tax imposed on a market. Say the per unit tax imposed on beer. The tax shifts the supply curve up by the amount of the tax. Let the no-tax equilibrium intersection of demand and supply be point *a*. The equilibrium intersection of the demand and the supply plus the tax can be labeled *b*. At the quantity demanded at *b*, the producers only receive *c* dollars per unit. The triangle *abc* vanishes. This area represents value that is destroyed by the tax. Of course the tax raise revenues. These go to provide for public goods which we hope are valuable. However, that value now taken by the government is not new value. It was already there. With the tax, and the consequent higher price, demanders consume less and producers receive a lower price. There is a net loss in value.

The same analysis can be applied to transactions costs. Let the tax be the cost of bonding. You hire a termite company to treat your house. They come out and spray a chemical solution around your

² Competition fails to maximize surplus, that is, fails to be efficient when property rights are not well defined and in the presence of public goods. An example of ill-defined property rights is the case of oceanic fishing. Ships dragging long fishing lines though the parts of the ocean that are not claimed and protected by any nation are significantly depleting the number of fish. Because this part of the ocean is not owned, fishing is carried on too intensively and too many fish are killed. Similarly, ocean going vessels often dump oil and trash at sea. This pollution is outside of the control of any property owner or nation. As a consequence, it is inefficient.

In the case of public goods, the free-rider problem can result in too little production of the good. Public goods are goods that can be consumed by one person without reducing the availability to others. For some such goods, it is difficult restrict consumption. For instance, when the animal society picks up and cares for stray pets, all animal lovers benefit, even those who do not contribute to the society. Hence, there are too many hungry strays.

foundation and promise you that no termite can get past this barrier for five years. This is exactly the protection that you want. However, how can you be sure that they sprayed with real chemical or just cheap perfume? You can't, so you require that they buy a bond. That is, they must pay an insurance company a fee. The insurance company in turn gives you a policy that says if termites appear within five years, they will compensate you for any damage. The cost of the bond is just like the beer tax. Because the termite company has to pay part of the price it charges for its service to the insurance company, some homeowners don't get termite treatment. They lie awake at night worrying about bugs. Some termite men are unable to buy their kids new Keds. Value is lost.

The Law of Efficient Asset Pricing

Demand and Supply deals with flows of goods and services. For instance, with D&S we analyze the monthly consumption of gasoline or the weekly consumption of milk. Some assets reflect a stock of future consumption or production. Efficient asset pricing says that the price of these assets embodies all information about the future value of the use of the asset. For instance, pasture land on the outskirts of Atlanta sells for a price far above the value of the grass to the cows. This is because soon the land will be used for urban development.

An implication of efficient markets is that price movements in assets that are frequently traded reflect changes in the fundamental value of the future cash flows from these assets. In this sense, changes in prices do not follow patterns predictable from the past, like fads or trends. Assets that are nontradeable, however, may follow trends or cycles.

Human resources are not generally freely tradable. There are some forms of indentured servitude, like the Army and ROTC. Sometimes people sign pledges to stay with the same company for an extended period or not to compete with the company if they leave its employ. Most often, though, the only way for an individual to capitalize on potential profits to his own talents is by borrowing money to invest in schooling. Since this is an imperfect option, we expect prices to be systematically incorrect. Consistent with this expectation, it has been shown that medical school enrollments and doctors' salaries follow a cyclical pattern. When salaries are up, enrollment go up, which causes salaries to go down and enrollments to go down.

This type of cyclical fluctuation in prices is not found in the stock market. There are many questions being raised today about the efficiency of pricing in the stock market. However, it is clear to everyone that there is no profit opportunity available by means of spotting "trends" in stock prices.

Some notes on the operation of the stock market. The most important stock market is the New York Stock Exchange. The NYSE is organized around two groups of traders, *floor traders* and *specialists*. Each stock traded on the NYSE is assigned to a particular trader (or trading firm) and that trader makes a market in that stock. The stock is traded at a specific post. All trades of that stock must occur by public outcry in front of that post. The floor traders bring order to the post. If a floor trader has an order to buy "at market" and there are no orders to sell, the market maker must sell the stock out of his own portfolio. The market maker is ordered by exchange rules to not change the price of the stock dramatically. Price must be stepped from one level to another.

A sister market to the stock market is the futures market. The most famous of these is the Chicago Board of Trade. Trade at the CBOT involves contracts to deliver standardized units of the commodities at some future date in exchange for a payment now. Delivery occurs less than 5% of the time. Most of the time, the contract is repurchased by the issuer either at a profit or a loss. Trade in future delivery of commodities reflect the interest of economic agents to reallocate real stocks of those commodities across time. Trade is conducted for each contract in its own pit. At the CBOT if the price of the asset changes dramatically, trade is halted for the day.

The best way to think of these securities markets is that they *create* prices. People come to the market with private information. All of this information is valuable. That is, all of it would in the absence of other information affect price. However, most of the time the information cancels out. Take the example of a frost in Florida that ruins some of the orange crop. The fact of the frost will cause orange juice prices to go up. How much is the question. Each farmer knows how bad his crop was affected. He does not know how bad his neighbors crop was hit. The farmers go to the futures market and trades orange juice contracts on the basis of the information about their own crop and a guess about their neighbors'. In the pit, this information weighs against itself and the cumulative effect is embodied in price.

In the case of a single piece of information held by one person, the market maker stands to take a loss. That is, the market maker will get "picked off" as he sells to the informed trader at a low price and then must buy back from that trader at the high price when the information is revealed (as happens when takeover attempts occur). However, when information enters the market from multiple sources about the same event, the market maker is in the position to buy low from those whose information is relatively gloomy and sell high to those whose information is on the rosy side.

In this way of looking at security markets, prices fluctuate more than the fundamentals. Similarly, option prices fluctuate more than underlying prices. The terminology here is somewhat misleading. Commentators call "fundamentals" the ultimate cash flows enjoyed by the firm, and it is commonly observed that stock prices do, indeed, fluctuate more than these "fundamentals." However, consider a hypothetical example concerning an automobile manufacturer, say, Ford. There are two analysts, working for different brokers, following Ford. One is studying Ford's R&D program and finds out that Ford is about to announce a new motor design that will drastically reduce gas consumption. Since Ford will be able to patent this, it will be able to charge a higher price for its cars (an amount equal to the gas savings unavailable to its competitors). Higher prices mean higher earnings. This analyst's broker tells its clients to buy Ford; thus, the price is driven up because of the expectation of higher earnings in the future.

The other analysts is looking into labor problems at Ford and finds out that Ford is about to be hit with a big discrimination complaint. Based on this information, Ford's earnings are going to be significantly depressed because of the legal fees and damages. This analyst's firm tells its clients to sell Ford; price is driven down.

Ultimately both things happen: Ford comes out with the new motor and gets hit with the labor problem. The combination of both problems leaves earnings unchanged. Earnings turn out to be flat. However, stock price fluctuated wildly. Stock price fluctuated on the basis of information that

was marginally significant. That is, each piece of information had a marginal impact on earnings. However, the margins cancelled each other out.

There is a second aspect of efficient asset pricing that involves the riskiness of assets. In finance this principle is called the *Capital Asset Pricing Model* or CAPM. CAPM starts with the idea that capital assets are priced based on their cash flows, but it also recognizes the Law of One Price, i.e., capital assets must be priced *relative* to one another. This relative pricing is achieved by recognizing that the riskiness of cash flows varies systematically across assets.

The CAPM model is built on several principles:

- 1) Fisher Separation Theorem: individuals separate their investment decisions from their consumption decisions. Assets are employed in their highest valued use and are simply sold when the current owner is wants to consume rather than save.
- 2) Because of the Separation Theorem, the individual's investment decision can be characterized in terms of the utility of the expected value of wealth. Investments have a random component that is the *riskiness* of the venture. In terms of the expected value of wealth, consumers are *risk averse*. That is, they would prefer less wealth with certainty to more expected wealth that has probabilities associated with it (e.g., \$40 in hand is preferred to a 50/50 chance of 0 v. \$100).
- 3) Given risk averse consumers, their investment choices are conveniently described in terms of the tradeoff between expected return (from a particular project or portfolio of projects) and the risk. Risk can be defined as the standard deviation of the expected returns (think of the normal, bell-shaped distribution).
- 4) The principle of *Diversification* results in the fact that when wealth is split between two assets, the expected return on the portfolio will be higher than the lower return and the risk can be lower as well. For instance, assume Duke Power stock has an expected return of 12% and risk of 1%. Let Viacomm have risk of 3% and return of 15%. The choice is to hold all wealth in Duke, all in Viacomm, or some in both. The result of diversification is that a portfolio containing both will always have an expected return greater than 12% and can easily have a risk that is *less* than 1%. It all depends on the correlation between the two stocks. Portfolio diversification extends to all stocks. The diversified investor holds many (more than 30, maybe as many as several thousand).
- 5) The result of this diversification phenomenon is that assets are priced according to the way they fit into a portfolio of all assets. That is, assets are priced according to their correlation with the rest of the market. Investors choose stocks based on how they affect the riskiness of their portfolio, which is due exclusively to the correlation between stocks. Hence, investors do not care about the risk of a particular corporation or asset. They can hedge that risk by diversifying, holding a large portfolio of assets.

An important implication of CAPM for our study is that corporations acting in the best interests of their stockholders will accept all positive present value projects regardless of the risk of the

ventures. In computing the present value of any project, risk must be included. However, the change in riskiness of the corporation associated with a new venture should not be a factor. In other words there is no value created when companies diversify. Investors can achieve exactly the same effect in the asset market.