

Chapter 7: The Organization of Markets

“Because trade had until recently required a place where buyers and sellers could come together to safely exchange their goods and money, markets originally developed where there was good access to transportation and communications.... But as commerce sheds its physical form, the need for the marketplace diminishes.”

Larry Downes and Chunka Mui, *Unleashing the Killer App*, p. 142, Boston, MA: Harvard Business Schools Press, 1998.

Prologue

Downes and Mui emphasize the death of the physical marketplace, to be replaced by a virtual one. Certainly, advances in long-distance transportation and communications have relentlessly expanded the geographic scope of markets. But what exactly constitutes a market? Do the Internet and e-commerce really mean that distance will no longer matter? Are location and physical form the only defining characteristics of the traditional marketplace? In what other ways may the scope of markets be expanding, or changing in general? Will we say good-bye to the kind of market described by Fernand Braudel in the second volume of his magnum opus:¹

‘On 1st March 1657,’ say the two Dutch travellers, ‘we saw the second-hand clothes market, (*la Friperie*) near the Halles. This is a large gallery, held up by stone pillars under which all these dealers...spread out their goods. At any hour going past there, one is assailed by the patter about their merchandise with which they seek to draw people into their stalls...One can hardly believe the prodigious quantity of clothes and furniture they have: one sees some very fine things, but it is dangerous to buy unless one knows the trade well, for they have a marvellous skill in restoring and patching up what is old so that it appears new.’ (p.36)

If so-called virtual markets will rule, what will they look like? What features will they share with physical markets of today? What are the rules of market organization today, and how robust will they be to going online? Why do we haggle in some markets, accept posted prices in others, and rely on auctions in yet other cases? How are transactions actually completed once a price has been agreed? How do markets work, in practical terms, and what lessons might this have for the online world?

Read on!

¹ *The Wheels of Commerce: Civilization and Capitalism, 15th-18th Century, Volume 2*. New York: Harper & Row, 1979.

7.1 Introduction

As the founder of the modern study of economics, Adam Smith, noted over two hundred years ago, the human tendency to trade and exchange is deeply ingrained in us. Certainly, our species has engaged in exchange for thousands of years. Often this has been ritual gift exchange, governed by strict tribal codes. Our own understanding of trading would be more voluntary, unfettered by social norms. Economists think of these processes of exchange as occurring in markets. In this general sense, a market is an abstraction, without a particular location or institutions. For example, one definition from an economic principles textbook is:

A **market** is an arrangement that allows buyers and sellers to exchange things, trading what they have for what they want.²

From that starting point, economics textbooks tend to focus on the workings of supply and demand, without going into the details of the exact mechanisms and organization of markets. There is much to be gained from that abstract approach, but it will not be enough for examining the economics of electronic commerce.

E-commerce inherently changes the physical organization of markets. Buyers and sellers are able to avail of spatial separation on a scale and with a scope never before possible. Information flows permit more rapid adjustment, and information processing allows for more complex forms of organization to be implemented at reasonable cost. Thus we must understand the dimensions of market organization, even if at a simple level.

In Section 7.2, we examine the scope of markets, in terms of geographic reach, the time they are open, and the range of products and services transacted in them. In Section 7.3, we discuss different mechanisms for reaching agreement on the price at which exchange will take place. These can include the full flexibility of haggling, the commitment to announced prices by sellers, and various kinds of auction methods, where buyers simultaneously bid for something, or sellers compete to provide something. In Section 7.4, we discuss how markets are organized to handle the completion of a transaction: performance by the seller, and payment by the buyer. Section 7.5 examines contracts, or terms of performance in some more detail, in the context of information problems that can arise in market transactions. Section 7.6 briefly introduces one dimension of market organization that can alleviate such problems, that is intermediaries. We will consider intermediaries in greater depth in Chapter 8. Section 7.7 rounds out the topic of market organization by describing how financial asset markets, our most sophisticated market institutions, are organized.

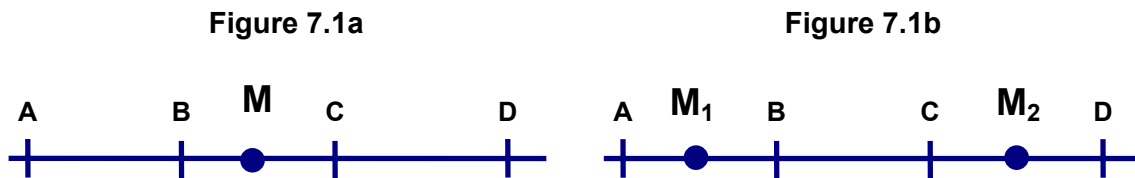
7.2 Location and Scope

Traditional markets were defined by a specific location, an associated geographic scope, a limited scope in terms of time (not being in operation throughout the week or year), and a range of products and services that were available, which could vary widely across markets. We can think of the evolution of modern markets as a relaxation of the

² *Microeconomics: Principles and Tools*, 2nd ed., p. 6, Arthur O'Sullivan and Steven Sheffrin, Upper Saddle River, NJ: Prentice Hall, 2001.

limits of geography, time and specialization. Perhaps the opposite extreme from the weekly town market of medieval times is the global foreign exchange market, where currencies are traded around the clock and around the world. The economic determinants of the different dimensions of market scope help us understand differences across types of markets and their evolution.

Location The location and geographic scope of markets can be examined from the perspective of the simple example of Section 5.5. We will consider a slightly different situation, with four identical buyers, A through D, who are distributed equidistantly along a road, as shown in Figure 7.1 below. In Figure 7.1a, there is a single market (marked with a circle and an M) in between B and C. This market may be composed of many different sellers – we will put aside this aspect for now. In Figure 7.1b, there are, instead, two markets. One is located exactly between A and B (denoted M_1), the other between C and D (denoted M_2). In all other respects except location, the markets are identical. We will now compare the economics of these two market structures.



Suppose that the fixed cost of the market is $\$F$ and the variable supply cost (to produce the goods and get them to market) per bundle of goods sold is $\$C$ per unit. Also, suppose that the transportation or distribution cost for individual B in the case of one market is $\$T$. Then C's transportation cost is also $\$T$, while for A and D it is $\$3T$. The total costs in this case are therefore $\$F + \$4C + \$8T$ ($8T = T+T+3T+3T$). In order to compare this situation with the case of two markets, we will abstract from how prices are determined, and consequently how the surplus that result from the market transactions is divided. Since the gross value to the buyers is the same in the two cases, we can just compare the total costs. In the situation in Figure 7.1b, the total cost is $\$2F + \$4C + \$4T$. As you would expect, which market structure is better depends on the relative size of the fixed costs of market organization and the costs of getting the products from the market to the buyers. Explicitly, we have:

- If $\$F > \$4T$, the single market is less costly.
- If $\$F < \$4T$, then having two markets is less costly.

Of course, for individuals to buy from the market nearest them, it must be that price differentials do not lead them to travel to the market that is further away. In the situation of Figure 7.1b, for example, we have assumed that B buys from market M_1 . What guarantees this? If there are enough sellers in each market such that prices are competitive, where we take that to be the case that there are zero economic profits then $\text{Price} = \text{Average Cost}$, or $P = C + F/4$.

If this is the price charged in each market, then B has no incentive to bear the extra costs of going to market M_2 , which is further away.

Various complications are possible. If the two market case involves different fixed costs, if there is a limited number of sellers, who can choose to be at one location or the other, but not both, and if sellers have market power as a result of this, then the comparison across the two situations will be more complicated. Additional complications arise when buyer information is not perfect, and they have to search: for example, searching in one place is easier and less costly than searching in two places. However, the general insight is still useful: as transportation and delivery costs decline relative to the fixed costs of market organization, the geographic scope of markets will increase. This has been one factor in the evolution of markets over time. In particular, we can buy from a seller without ever being in the same place, thanks to long distance communications and delivery services. If the product or service is not tangible, does not require 'touch', then geography becomes almost irrelevant. Markets become national or global in scope, a true illustration of the 'death of distance'.

Time Traditional markets were not just limited geographically. Since sellers were typically producers as well, markets where they offered their wares to buyers could not be continuous entities. Medieval towns had weekly 'market days', when buyers and sellers could gather to transact. Thus time as well as place defined a market. However, a greater density of buyers, associated with the growth of populations in general and towns in particular, and greater specialization in production, associated broadly with the Industrial Revolution, increased the demand for marketed goods enough that permanent markets arose.

We tend to call such permanent markets by other names: shopping centers, malls, shopping plazas, and so on. In many other countries, the word 'market' is still used for such entities. However, there is one major economic difference between the shopkeeper and the traditional market seller. In traditional markets, the seller was the producer. Marketing (in the historical sense, and not the modern one!) was just a small part of his or her activities. The typical shopkeeper is a specialist – not a producer, but just a seller. 'Just' here covers a wide range of activities: maintaining inventories, aggregating across producers, relaying customer information back to producers, providing credit, and so on. We will examine these functions briefly when we introduce a discussion of intermediaries later in this chapter, and in more detail in the next chapter. Here we stress that the expansion in demand ('the size of the market') changed the organization of markets in a fundamental way, by permitting increased specialization. This specialization allowed the physical manifestation of markets to become permanent shops, open five or six days a week, rather than weekly or monthly gatherings of buyers and sellers. The scope of markets over time expanded along with geographic scope.

As markets have expanded geographically beyond local boundaries, this has naturally put pressure on their time scope. Currency markets have tended to lead the way here, because they are inherently global – trading US dollars for Japanese yen inherently links the two countries currency dealers, even though they are many time zones apart (17

or 7, depending how one views it). Recently the US stock market has also given in to this pressure, and extended hours of trading for US stocks are gradually being introduced. Note that this is quite different from the reasons that lead to convenience stores and grocery stores having extended hours. In that case, modern urban life, with its 24-hour cycle, is the driver, rather than geographic scope.

Product Range Specialization has increased in another way as well, though not in all cases. Traditional markets were a place where a full range of products and services were available. While a pre-industrial economy might have been limited in the range of manufactured goods available, the number of categories was perhaps not that different: tools, clothes, kitchen items, and so on. Furthermore, many services were also available in such markets: personal care, entertainment and news among them. When congregations of buyers and sellers were specific occurrences, bound by time and place, it made sense to gather everything together in this way. Economies of scope were powerful. In the location example we constructed earlier in this section, we assumed that there was a fixed cost of market organization. In fact, because we did not dig beneath the level of a given bundle of products and services in that example, this fixed cost could be the source of economies of scope as well as economies of scale (see Section 5.3). Furthermore, the transportation/delivery cost of \$T in that example could include a fixed cost of traveling to the market, as well as a component proportional to what was purchased. The fixed cost would be a source of economies of scale (if the person buys more) and scope (if the person buys a wider range of things).

Economies of scale and scope also enter into the organization of modern-day successors of town markets – shopping centers, plazas and malls, and even department stores. Any individual store or chain of stores can benefit from economies of scale and scope, as we have discussed in Chapter 5. However, grouping different businesses into a shopping plaza or mall provides economies of scope in shopping, rather than economies within any single business. Driving to the mall, or going to the grocery store with the drug store, dry cleaner and video rental store in the same location, is the modern equivalent of visiting the town square on market day five hundred years ago. I can still benefit from economies of scope, even though my travel costs are low. They are not zero. And I may use a more expensive dry cleaner because it is close to my regular grocery store, while a cheaper one is not so conveniently located.

Shopping online, with home delivery of physical goods such as groceries and prescription drugs, may still preserve some of these economies, because the suppliers are located close together. Shopping online for books, CDs, tools and housewares, which will be shipped from warehouses, will be subject to a different set of rules. There still may be benefits from the creating and using the online equivalent of shopping malls, but economies in travel or delivery will not matter in such cases. This is a topic we will take up in future chapters.

Mobile Markets We can not leave the topic of market location without mentioning an alternative that still flourishes in many places. The market itself can move. Peddlers, or traveling salesmen of all kinds represented a kind of mobile market, bringing products

and services to the doorstep. Traveling salesmen might specialize in a particular service or product, or provide a wide array, depending on factors such as population density, standards of living, and so on. They might have been producers themselves (in the case of services, especially), or more often, intermediaries with many of the same roles as shopkeepers in fixed-location shops. While traveling salesmen still exist for business-to-business transactions where relationship building and information sharing require face-to-face contact, even in those cases their role is changing. For household buyers, a variety of economic and social changes has led to the demise of the traveling door-to-door salesman. Sales pitches do arrive through the mail or the telephone, and they may even lead to transactions, but the efficiency of modern retailing has left no place for the peddler, even before the Internet came on the scene.

7.3 Pricing Rules

Any market, whatever its scope, will be also be characterized by a set of rules of organization. These rules are typically not formally set out in many markets in which we participate. In traditional markets, there might be informal rules of social convention (“don’t make an insulting offer”, where what is insulting might vary across countries). Often governments will make some rules of market operation, beyond collecting taxes.. Medieval town governments would place limits on what sellers were allowed to charge, for example. Maximum retail pricing laws still persist in many situations.

The organizers of a market may make rules for participants, including who may participate, as well as how they may operate in the market. Financial markets are particularly sophisticated in this respect, and we will devote a separate section to the basics of their organization. The most obvious and central aspect of market organization is the rules that govern how the price is agreed at which the transaction is conducted. We are used to a couple of simple pricing rules, but the advent of e-commerce has increased the variety of practical (though not theoretical) options, and so a look at this basic part of market exchange is useful.

Haggling Haggling, bargaining and negotiation are the oldest and most general form of price determination. Anyone who has bought something in a flea market or a garage sale, or at a stall selling tourist artifacts in another country has almost certainly engaged in this method of making a deal. Larry Ellison and the car dealer with the red Ferrari (Section 6.2) would presumably engage in a similar process. In some sense, there is no given rule here. Either side may make the first offer. The other side may counter, refuse, walk away, stay silent. The buyer and seller engage in a freeform conversation, each trying to signal his or her toughness and get the best deal possible. There may be some social conventions to be followed, in terms of what is said or done, but even these may be bent in the heat of the moment.

The process sounds like hard work. While some enjoy it, for others it is unpleasant. If there is no entertainment or amusement value in the process, then only the costs of time and discomfort remain. The person who is uncomfortable or in a hurry may therefore be at a disadvantage in bargaining. Overall, the costs of haggling may make it a

method of market pricing that is less desirable. Indeed, one can argue that, as the value of time increases, haggling becomes a less common method for pricing. Still, some of the benefits of haggling, in completing transactions that would otherwise not occur without its flexibility, can be retained in more structured methods of making offers to buy and to sell, as we discuss below.

Posted Prices Posted prices are probably the market pricing rule that we, as consumers, are most familiar with. For an enormous range of consumer goods, what we see is what we pay. If I go into a grocery store and think that the price of my favorite cereal on the shelf is too high, I can look for it elsewhere, but I can not begin to haggle over the price. This is what we mean by posted prices.

The fact that prices are posted has an informational value, and this information is conveyed efficiently. Anyone can scan the posted prices, and decide whether it is worth investigating the product characteristics, or whether a familiar product is worth buying at that price. There is obviously a tremendous efficiency benefit over having to ask store personnel the prices of all the groceries we want to buy, and for them to answer such questions for every customer or potential customer. Of course advertised prices may not be firm prices. To distinguish this case, we can call them ‘list’ prices. List prices, in this terminology (and often in practice), are just the starting point for haggling.

The time cost of haggling also gives a seller a way of committing to a posted price, that is, not responding to a counter offer, which would begin a haggling session. Commitment can also be obtained by limiting the discretion of employees who come face-to-face with customers. This may be a byproduct of giving the employees proper incentives (which we discussed in Section 5.4). What provides an incentive to the seller to shade the price is, of course, the fear of losing the sale. A sale at a slightly lower price is better than no sale at all. Posted prices can hinder the seller from charging higher prices to buyers with higher valuations (higher willingness to pay), and thereby capturing more of the value created by the transaction.

Luckily, sellers who use posted prices have many ways of **price discrimination** in practice. We shall treat this more formally and completely in Chapter 14, but here we note that varying the posted price over time is one method of achieving this. This is different from haggling, since the change in the posted price will apply for everyone, but it achieves some of the same effect as haggling. Instead of accepting a counter-offer at a lower price than the posted price, the seller can say, ‘wait till next week’s sale’. If every buyer is willing to wait, this just postpones the transaction for all of them. Instead, if there are some for whom waiting till next week, or returning to the store is costly or inconvenient, they may still purchase at the current posted price, while the others come back later, and they are not lost as buyers.

All kinds of other factors may influence sellers’ preferences between posted prices and haggling. Buyer switching costs, what sellers and buyers know about each other, the nature of their ongoing relationship (if any), the value created in individual transactions (recall Larry Ellison and his purchases of cereal and Ferraris in Chapter 6),

the number of buyers and sellers, and the degree of product differentiation (see Chapter 13 for a treatment of that topic in general) are aspects of the market that will matter. These complications make a simple theoretical prediction difficult³, but one can hazard the following guess. If competition is not too strong – few buyers and sellers, high value individual transactions, high switching costs, high differentiation between sellers – sellers will avoid posted prices.

Ultimately, competition may be what encourages sellers to use posted prices. In some case, government regulation may achieve the same end, to give buyers a better deal. Government regulations requiring posted prices will typically apply only to consumer markets. Business-to-business (B2B) transactions are not regulated in this way, and since they often have many of the characteristics that support haggling, this is what we observe in practice. The haggling may not take the form of what transpires in a flea market, but its essence is the same. The perspective of this section will therefore be useful when we look at B2B e-commerce exchanges, in Chapter 12.

Auctions Auctions are actually an ancient form of determining transaction prices that have continued in various forms, until the electronic auctions of the Internet age. We begin with describing the essential characteristics of simple traditional auctions, and then consider the many variations that occur. A traditional auction would have the following features: one seller, one item (or collection of items) for sale at a time, and multiple potential buyers who can bid for the item. A **bid** is an offer to buy at the price specified in the bid.

In contrast to haggling and posted prices, this simple auction does not involve the seller quoting a price, or making a counter offer to any buyer. An auction might have the seller specify a minimum, or **reserve price**, below which he or she would not sell. The characteristics of not revealing seller information, and having buyers compete, suggests that this method would be advantageous for the seller in terms of selling to the buyer with the highest willingness to pay (creating the most value), as well as capturing as much value as possible from the transaction. This intuition is roughly correct.

Why, then, would sellers use any other way of organizing a market? Why are houses and cars not sold this way? If a single house seller haggles with several potential buyers, then going back and forth between offers from buyers has features similar to an auction. Instead of the buyers being gathered in a room, and calling out bids as in a traditional auction, they make staggered offers, which the seller can announce to other buyers, letting offers rise and buyers drop out until only one potential buyer is left. This can happen especially in a ‘hot’ real estate market (Silicon Valley 2000!), but at other times there is only one buyer negotiating with one seller.

In general, the costs of organizing a traditional auction, and the need for multiple bidders, have made it unsuitable for most consumer goods. Timing and relationship

³ My colleague, Daniel Friedman, is working with his collaborator Tim Cason on experiments that will help generate predictions on the relative working of different pricing institutions.

issues would also work against an auction in business-to-business transactions: organizing periodic auctions among business customers would be a cumbersome procedure, and short term gains in value captured from using an auction might be outweighed by negative impacts for future custom. Implicit in this argument is a major reason traditional auctions are not so common in these markets: competition among sellers limits their benefits for any single seller. Only where goods are differentiated or, in the extreme case, unique, would traditional auctions be attractive. Art objects and oil and gas leases fit this bill, and have typically been auctioned. In the latter case, the government is a monopolist, which also supports the use of auctions. The government also auctions bonds (which involve borrowing money from the private sector) and portions of the communications spectrum.

Among the additional details of auction organization are rules of participation (payment to participate, or evidence of financial resources), rules of bidding (open, sealed), and rules of price determination. The latter might seem obvious – the winning bid is the price paid – but variations are possible here also. For example, the winning bidder in an open, repeated bid auction could be required to pay the only the amount of the second highest bid. Interestingly, it can be shown using economic theory that this curious ‘second price’ open auction will yield the same outcome as a sealed bid auction where the winner pays what he or she bid.

There are other variations on the auction method for determining the transaction price. The Dutch auction, used in the Netherlands for flower auctions, involves the seller starting with a high price and reducing it until a buyer steps in and accepts. Again, one can see the relationship to haggling (offers that are adjusted), as well as the differences (multiple potential buyers at one time, limits on who can make offers). In this case, the seller’s offers to sell are **asks** rather than bids (offers to buy). The roles of buyer and seller may be reversed in another way, if there is a single potential buyer, and multiple potential sellers. The buyer may state requirements, and sellers may compete to fulfill the buyer’s demand. This is a **procurement auction**, used by businesses as well as by governments, and the benefits to the buyer are similar to those for sellers in conventional auctions.

The procurement auction has become famous when transferred to the consumer arena, as Priceline.com’s ‘reverse auction’ (see Chapter 3 for a discussion of the patenting issues in this case). In this case, the power of information processing and communications has reduced the costs of conducting such auctions. Similarly, consumer-to-consumer auctions, pioneered by eBay and imitated by Yahoo, Amazon and others, have become ubiquitous precisely because the transactions costs associated with traditional methods of conducting auctions have been substantially lowered by new technology. We will discuss online auctions in Chapters 10 and 12.

If the essence of auctions is the making of offers to buy (bids) and sell (asks), then we can apply the term auction market to many kinds of financial markets. Markets for stocks and other financial assets involve both buyers and sellers making offers. Offers to buy and sell are matched or reconciled in various ways, and the bidders and askers may

leave the market, or continue. These financial markets are like a permanent bazaar. There is no haggling over any single transaction, but bids and asks are constantly being adjusted based on the observations of what is happening in the market: what trades are conducted, at what prices, and by whom. These markets are **double auction** markets since both sides of the market make offers, and there are many potential buyers and sellers at once. Bids and asks are made to the other side of the market, not particular individuals, as would be the case with haggling. We consider double auctions in more detail in Section 7.5 below.

In sum, auctions are a distinct method of determining prices. They provide efficiency advantages over posted prices and haggling, in terms of ensuring that market transactions maximize the value created by exchange. Their costs and disadvantages are reduced by technological change, and this explains their increased prominence, especially in consumer markets. Double auctions are the method of determining transaction prices that are perhaps closest to the textbook supply-demand story (Figure 4.20) of competitive markets.

7.4 Performance and Payment Rules

We have discussed the set-up of markets, their scope, and the mechanisms for agreeing on the terms of exchange. The remaining aspect of market organization is what happens after agreement is reached. The simplest possible transactions involve simultaneous two-way exchanges of goods or services (barter), or exchanges of money for products or services. The buyer can inspect a product before purchase, or otherwise judge its quality or characteristics (which is all that can be done in the case of a service!), but once the exchange is made, the transaction is complete.

Market transactions in a modern economy allow for considerably more complicated transactions. We can classify the complications into two categories: performance and payment. Performance refers to all the aspects of the seller's side of the exchange, while payment refers to the buyer's side of the exchange. Here we assume that the buyer pays with money or a similar financial transfer, so we exclude barter from this discussion. Barter would involve performance issues on both sides, and so our discussion can be extended to it naturally.⁴

Performance Even when a simple physical product or a service is provided immediately after agreement is reached, there may be performance problems. The buyer may not obtain what he or she expected. Depending on the rules of that market, the buyer may have a right to obtain better performance, or to have the payment adjusted, or, in extreme cases, be entitled to damages. Often such rules are determined for classes of markets, and are determined by general laws. The best example of this is consumer protection laws, which provide individual household buyers with standard sets of rights, such as the

⁴ Barter is not a trivial part of the modern economy. Individuals and businesses may use it when they do not have immediate financial resources. It may also provide an avenue for tax avoidance. One reason it is not so common is the difficulty of matching required for barter. Clearly, the Internet offers informational potential for lower-cost matching, and B2B online barter exchanges are being developed.

ability to return a product within three days for a full refund, or warranties of performance over a longer period, and so on. Seller concerns for reputation and repeat buying may substitute for legal protections in some cases, especially where competition among sellers is strong enough.

Ultimately, disputes on performance may be resolved in court. In some sense, therefore, the supporting legal system is a part of the organization of markets. This is why the legal approval of digital signatures (see Chapter 3) lagged behind the technological capabilities for implementing them. The new law had to make sure that existing broad legal protections for consumers would carry over effectively to electronic agreements. Basically, buyers would need to know what they were agreeing too. Some concerns still exist in this arena.

There is less concern, perhaps, in the case of B2B transactions. Since these are inherently higher value and more complex on average, they have tended to involve much more explicit contracts, drawn up by legal professionals. Such contracts can specify performance more exactly, and even the liability of the seller for any failure to perform according to the contract. Contract law is an important and lucrative branch of the legal profession. Even in the case of B2B transactions, reputation and competition may be the typical enforcement mechanisms, with the legal system serving as a back-up. However, an ineffective legal system may undermine the effectiveness of voluntary performance incentives. For example, if the courts can never manage to find you in the wrong, your potential reputation loss from not performing may be lower. We further consider contracts in the context of market organization, in Section 7.6.

We can think of some of the performance problems on the seller's side as an aspect of transaction costs. Thus they are closely related to the issue of where the boundaries of the firm are drawn. Focusing on market organization gives us an additional perspective. If markets – here using the term in the sense of specific institutions rather than as an abstract concept – have efficient external and internal methods of dealing with performance problems, then they will handle more transactions. One class of markets where such concerns are vital is markets for financial assets. Whatever the boundaries of firms happen to be, financial assets representing claims to firms' profit streams (that is stocks or shares) must be traded as efficiently as possible. Financial markets represent the most sophisticated forms of market organization in all these aspects (see Section 7.7). Their performance and evolution provides lessons for the organization of all kinds of online markets.

Payment Immediate payment in cash for a product or service is the simplest, most traditional method of completing a transaction. What is interesting is how much this simplest payment method is departed from, and how old these departures are. As we noted earlier, the shift from periodic markets to permanent shops also involved shopkeepers taking on other roles. Deferred payment, or credit, for known customers has been common for hundreds of years. What has changed is the institutionalization of credit. Specialized financial institutions now provide the underpinnings for deferred payments.

Financial institutions such as Visa and Mastercard have driven the organization of payments in consumer markets. The ubiquity of their credit cards is more the result of their efforts than the desire of retailers, though retailers certainly do not want immediate liquidity constraints (lack of cash in your wallet or your bank account) to stand in the way of a purchase. Retailers pay a fee when customers use these credit cards, and they prefer to have their own store credit cards used as much as possible. In either case, the purchase is bundled with the provision of credit (deferred payment for a fee). The difference from the corner grocery store providing the same service is simply one of who bears the risk and who receives the interest payments.

Even checks, which are conceptually like cash rather than credit, introduce organizational wrinkles into the payment side. While cash payments may be deposited directly into the seller's bank account, checks have to be presented to the buyer's bank for ultimate completion of the payment. Individual 'clearing' of these checks would obviously be very costly, and banks early on developed a system of **clearing houses**, where claims could be aggregated and netted out. These background institutions therefore permit the use of checks for making payments. Of course, in some circumstances (a garage sale or flea market) having a sophisticated clearing house system in the background is irrelevant: the seller will not take the risk of accepting a check that will not clear.

Payment delays have been a staple of business-to-business transactions for hundreds of years. The extension of credit became a way of financing long-distance trade in the absence of formal credit markets. In those cases, a buyer might pay with an I.O.U. because his ship had literally not come in. If the seller needed cash, he could sell this I.O.U. or **bill of exchange** to another merchant at a discount. Bills of exchange might be discounted and traded many times, and clearing houses for them developed well before similar institutions for personal checks. While more formal loan procedures have replaced much of this system of commercial credit, short-term borrowing in the form of delayed payment for purchases is a standard feature of B2B transactions. The mundane task of managing the timing of payments and receipts can be a significant aspect of a business' financial management. A business is in good shape if it can quickly receive payment for what it sells, and take its time in paying for its own purchases of inputs. Another feature that has changed over the last two decades is the introduction of **electronic funds transfer** (EFT) between businesses, so that payment clearing no longer involves pieces of paper, but only balancing electronic accounts. We will look at developments in payments systems more closely in Chapter 12.

A final aspect to consider in the process of completing a transaction is the problem of simultaneously dealing with performance and payment concerns. The solution to this has been **escrow** arrangements, where a neutral third party acts as a temporary holder of the product and the payment. The most familiar example of escrow is in the house buying process, where the payment and the title deed are given by the buyer and seller respectively to the title company, which holds them in escrow until everything is confirmed to be in order, and they can be released to the recipient of the

money and the new owner of the house. Escrow is another example of an arrangement where traditional implementation involves high transaction costs, making it suitable only for high value transactions, but where electronic information processing technology reduces these costs to make it more generally feasible. Online auction sites such as eBay have introduced escrow procedures as an option, precisely to overcome simultaneous problems of performance and payment.

7.5 Information Problems

As we have seen, one of the fundamental problems of complex exchange is performance by the seller. In this section, we examine this problem in more depth, as a prelude to examining forms of market organization that can address the problem. The case we consider is where the quality of a product is known to the seller but not to the buyer. The seller fails to disclose the true quality to the buyer. In the extreme case, and without countervailing institutions, the market can unravel, with little or no trade taking place. Since this example was originally developed by George Akerlof in the context of used cars, which are colloquially known as ‘lemons’ when they are of low quality, this is known as the ‘Lemons Problem’.

Figure 7.2a: Market for High Quality Cars

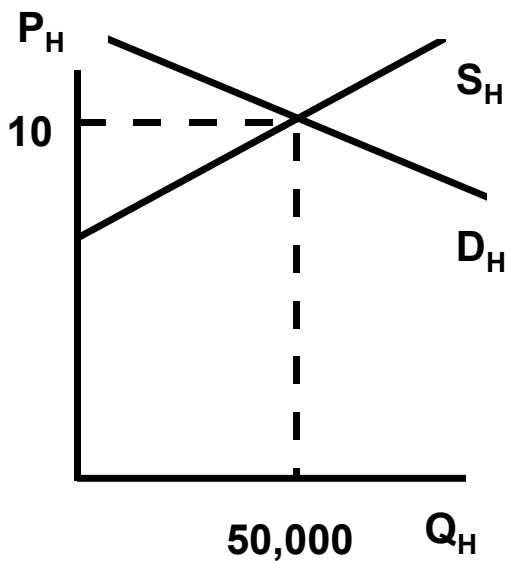
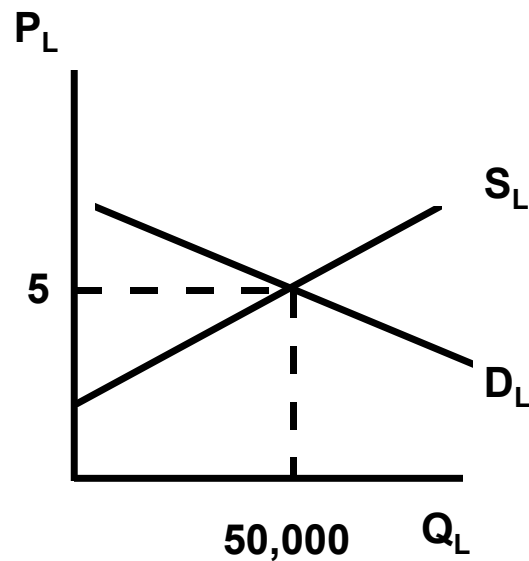


Figure 7.2b: Market for Low Quality Cars



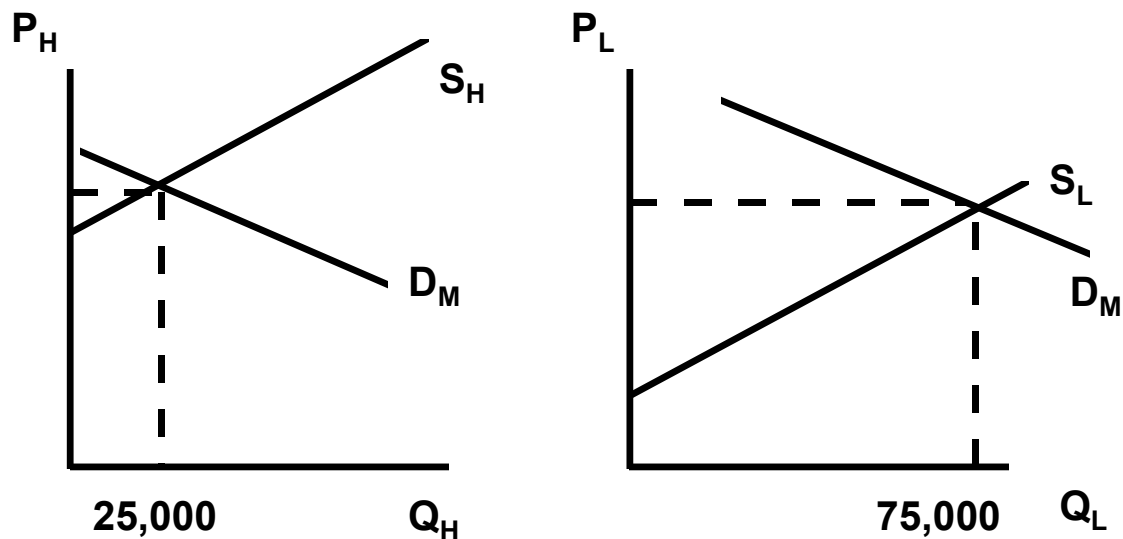
We begin with the case of full information. In the example, suppose that the used cars are all essentially the same in terms of model, make and year, but can be either high quality or low quality, depending on how they have been driven, or how they were originally manufactured. If buyers can observe the quality, or if sellers truthfully disclose it, then the situation is as we illustrate in Figure 7.2. High and low quality used cars are essentially sold in different markets. We assume that these markets are defined in scope by the ability of buyers and sellers to costlessly switch to alternatives. The price that sellers are willing to accept and the price that buyers are willing to pay are higher in the case of high quality cars, and lower in the case of low quality cars. As a result, cars of

different qualities have different prices. In the example, we assume that 50,000 cars of each quality are bought and sold, but the high quality ones sell for \$10,000, while the low quality cars sell for \$5,000. Note that we are using a standard demand-supply diagram, so that the exact method for determining the price at which exchange occurs (the topic of section 7.3) is left unspecified.

Now we change our assumption that the buyers are informed about the quality of individual cars. Instead, they only know the average quality of cars on the market (based on the 50:50 split above). For example, some expert may have tested a few cars and formed this judgment. If buyers do not know the average quality, then the point we are going to make will hold even more strongly. Sellers still know the quality of the individual cars they sell, so the supply curves in Figure 7.3 are the same as in Figure 7.2. However, buyers, since they know only average quality, must use that as a guide in determining their willingness to pay. As far as buyers are concerned, there is only one market for used cars. Since the supply curves are distinct, we show this by drawing two demand curves at a level in each market, such that the price for each kind of used car is the same. If it were not, then the price itself would signal something about quality. Since the demand curve for high quality cars is based on average quality, it is lower, and the quantity of high quality cars sold is lower. Conversely, the demand curve based on average quality results in more being offered to sellers of low quality cars, so more of them are sold.

Figure 7.3a: Market for High Quality Cars

Figure 7.3b: Market for Low Quality Cars

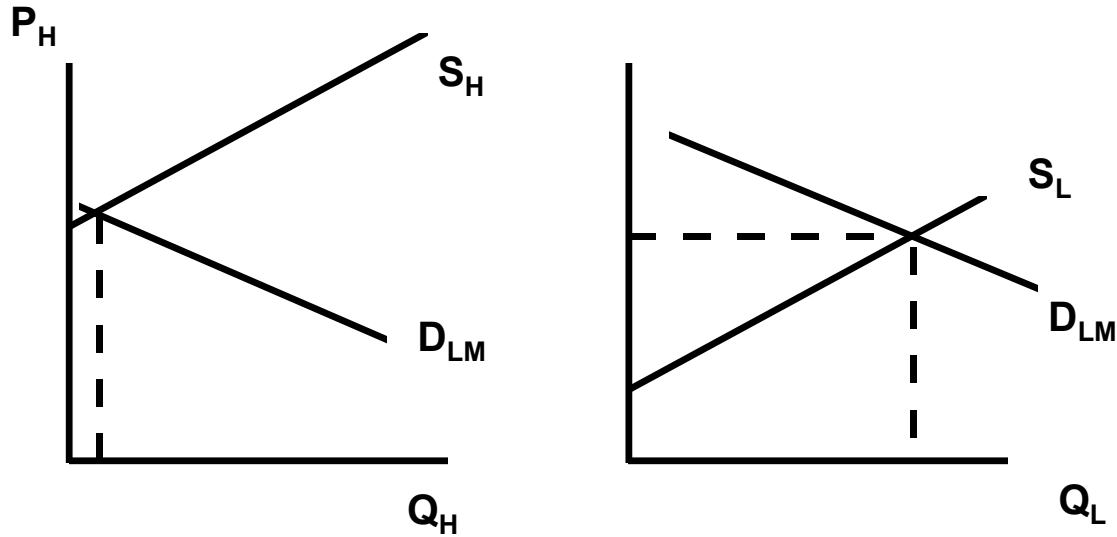


In Figure 7.3, we assume that the quantities of high and low quality cars sold are 25,000 and 75,000 respectively. Now, however, we have a problem in accepting the situation in Figure 7.3, because the demand curve labeled D_M is based on the 50:50 assumption for the ratio of high and low quality cars in the market, and the actual ratio is predicted to be 25:75. If individual buyers realize this, then their willingness to pay

should be based on this ratio in calculating average available quality in the market: a buyer is three times as likely to get a low quality car as a high quality one. In that case, the demand curve should be even lower, as depicted by D_{LM} in Figure 7.4. Now willingness to pay is so low that high quality cars are almost driven out of the market. Only lemons will be sold. In an extreme case, with a range of qualities, the market could unravel completely, with the volume of trade being negligible.

Figure 7.4a: Market for High Quality Cars

Figure 7.4b: Market for Low Quality Cars



Note: D_{LM} is based on the 25:75 assumption for the ratio of high to low quality cars.

What are possible remedies for the lemons problem? As we discuss in Chapter 15, sellers may convey information to buyers through informative advertising. They may also invest in building reputation, or offer credible guarantees or warranties, which in turn must be supported by reputation or by external legal codes. Alternatively, external intervention may be more direct. Industry groups, governments, or consumer advocacy groups can establish minimum standards and/or provide certification. In a related approach, trusted third parties (public or private) can provide detailed quality information. We discuss such intermediary solutions briefly in the next section, and in greater detail in Chapter 8, as part of a broader treatment of intermediaries.

Here we examine the nature of possible contracts, and how they may be used to ensure that sellers provide high quality, even in the absence of direct information on quality. Consider the case of a B2B exchange. In section 7.4, we noted that a buyer could spell out the quality requirements in a procurement contract, that could be legally enforced. It could institute a random but consistent procedure to verify quality, and ask for remedies from the seller if problems were found, suing legal action as a last resort. However, other incentive mechanisms do not rely so much on external intervention. Instead, both use variations of market competition to provide incentives.

One possible incentive mechanism is competitive bidding. A buyer can offer a procurement contract to large pool of potential suppliers, who bid to supply the product, and the lowest bid wins. Quality can be checked on each delivery. If a delivery is not up to standard, the short-term nature of the contract allows the supplier to be replaced the next time around. Alternatively, legal action can be taken if there was a violation of a contract provision. With competitive bidding, the promise of repeat business is less of an incentive provider than the immediate threat of losing out on the bid.

Alternatively, the buyer can offers procurement contracts to smaller group of suppliers, based on past performance. Delivery sizes may be relatively small, allowing just-in-time purchasing, and deliveries may not be checked for quality, which also saves time. This approach is therefore attractive where flexible, customized production is possible. To work, this approach requires long-term relationships between buyers and suppliers. The contract length in this case is open-ended, rather than being a determined by periodic formal bidding. There must also be smaller numbers, so that the buyer has leverage. Terminating the relationship for lack of performance (supplying lemons) will matter to the supplier if the supplier earns economic rents from the relationship.

Just-in-time purchasing is just one example of an incomplete contract. The general idea is that it may not be optimal to specify even verifiable product features too closely, if this distorts unverifiable features (for students, grades are verifiable but learning is less so!). The threat of non-renewal of the contract (or, equivalently, the reward of future contracts) may be the best incentive scheme given these limitations.

7.6 Intermediaries

The replacement of periodic markets where producers and consumers traded directly by permanent shops represented one kind of intermediation. The shopkeeper aided the organization of the market by removing the need for producers and consumers to coordinate a meeting. The shopkeeper could reduce the transaction costs of exchange, allowing producers and consumers to supply and obtain goods at times convenient for each. By aggregating over producers, the shopkeeper was also able to take advantage of economies of scale and scope.

Even before the development of shops, peddlers provided a similar intermediation service on a smaller scale. They were aggregators of (typically nonperishable) goods that they brought close to households by traveling from village to village. The extent of the market was defined by the range of the peddler's travels, rather than by the area from which buyers and sellers came to visit a town market. Merchants performed the same kind of transportation service as peddlers, but on a much larger scale. Long distance trade routes by sea and over land (the Silk Road of Central Asia) were in existence thousands of years ago. Long-distance merchants might buy directly from producers and sell directly to consumers, but they might also buy and sell from local traders. In that case, the intermediation function would itself be further specialized. In all these cases, intermediaries enabled markets to function and expand in geographic scope.

Intermediaries may aid market organization by actually purchasing and reselling products. Alternatively, they may provide other services that support the coordination of exchange. In the previous section, we emphasized the problems created by asymmetric information, in particular, the inability of buyers to accurately judge quality. Intermediaries can specialize in providing this quality information. They may also provide other kinds of information, simply making buyers and sellers aware of trading opportunities, and the possible terms of exchange, thus improving the matching process that takes place in the market. Real estate brokers clearly provide these services for the housing market.

Intermediaries may also provide services related to the actual exchange process. Real estate brokers will conduct negotiations on behalf of the buyer or seller, make sure that the legal aspects of the transaction are in order, and help coordinate and complete the performance and payment actions that complete the transaction. By being specialized in such tasks, as well as the pure informational tasks, brokers benefit from economies of scale and scope as well as economies of specialization (see Section 5.3). By being in the market for a longer time and more often than any individual buyer or seller, such intermediaries also have a greater incentive to perform well than an individual seller might.

Intermediaries create value by providing a range of services. For example, if a specific trade would not take place without the help of an intermediary, then the intermediary, the buyer and the seller all have a claim to the value created by the trade. For example, Larry Ellison of Oracle, who was introduced to you in Section 6.2, recently bought a \$10 million yacht. We do not know the exact value of the surplus created by this transaction, but it is likely to be several million dollars. He is being sued by someone who says he helped this transaction take place, but was denied a promised commission of \$700,000. We will return to this issue of value creation and value capture by intermediaries in Chapter 8. Clearly, if new kinds of intermediaries are possible in e-commerce, the issue of value capture will be important. Changes that reduce the value of intermediaries will also be important to analyze.

A final aspect of market organization is the role of a central authority in specifying the rules of the market: physical location, who may participate, what participants may do in reaching an agreement to trade, and how a transaction is completed. Even medieval markets relied on local governing bodies to provide this level of organization. While governments still play a role in providing the basic legal framework for all markets, the institutional details of market organization are often determined by the market participants themselves. Where intermediaries have a significant continuous role in a market, they often become the main arbiters of market rules. Hence another role of intermediaries is literally ‘making the market’, by defining and enforcing its rules. We will next explore this and other aspects of market organization in the context of financial markets.

7.7 Financial Market Institutions

Financial market institutions are the most elaborate and organized markets. This is because of the significance of what is traded (financial assets), the range of these financial assets, and the frequency of trading. The ‘money game’ is now played to the hilt on Wall Street and places like it all over the world, and underpins the entire real economy of goods and services. We provide a brief overview of the organization of financial markets here, taking it up again in Chapters 12 and 20.

Firms and Finance We described firms and their rationale and boundaries in Chapter 5, without considering their finances. We did allude to trade credit in Section 7.4. In B2B transactions, delaying payment to the seller may help the buyer save cash for more urgent needs, but only increases the seller’s need for the means to meet its own payments. Where does the money come from in the first place? That is the role of finance. We have used the word ‘capital’ in Chapter 4, to mean the equipment and machines that a firm uses in production. In the context of the financing of firms, capital refers to the financial resources that the firm has to pay for all its inputs. We will present a very simple picture of the financing of firms.

Essentially two basic ways of financing are available to firms: borrowing and selling ownership shares. Within each category, numerous variations are possible, and hybrids of the two types can also be devised. Long-term borrowing is done through issuing bonds, which carry a fixed rate of interest, and an obligation to repay the principal. Ownership shares are the source of stock market frenzy, since they are the ‘stocks’ that are traded on those markets (see Illustration Box). They carry no fixed obligation of any kind of payment, but their market value reflects the perceived value of the firm. Stocks and bonds may be bought by individuals, other firms, or organizations such as pension funds. Bonds are also issued by governments that wish to borrow money, and while individuals do not issue bonds when they borrow money for purposes such as house-buying, their mortgages can be bundled into bonds which are bought and sold much like government and corporate bonds.

Much of the trading of stocks, shares or equities (these are all equivalent terms), does not represent new financing of firms. Trading takes place only because new information causes people to change their valuations of firms’ shares, or their own circumstances cause them to change their portfolios (for example, retirement may mean selling off shareholdings to make up for lost income from working). When a firm is starting up, it may sell shares to individuals (**angel investors**) or **venture capital** firms. These shareholders then own part of the firm, but there is no organized market for the firm’s shares. Any transaction has to take place through a negotiation, and there may be no buyer at all if the firm’s prospects do not look good. When firms are more established (and the criteria for that have gotten somewhat more lax than before), it ‘goes public’. This means that it issues shares to the general public for the first time, and it does so through a listing on one of the major stock exchanges. These stock exchanges are the institutions we describe in this section. the mechanics of an IPO (Initial Public Offering) are quite complicated, and we will take up how the Internet affects IPOs in a later chapter.

Illustration Box **What is a Firm's Value?**

One possible answer to this question, especially in the light of our discussion of firms in Chapter 5, is that the value of a firm is the value of the assets that are owned by the firm. Yet if we try to use accounting numbers ('book value') to do this, we may go very wrong. The reason is that accounting valuations do not reflect what an asset is worth currently, and in combination with what else is at the firm's command. Furthermore, accounting valuations neglect intangible sources of value: intellectual property and the skills of the firm's workforce. Of course the workforce is not owned in the same way that physical assets are, and that justifies the accountants' caution!

A completely different approach is to value the firm in terms of the returns it can generate for its owners. Suppose that the firm can earn \$D a year forever in accounting profit, and that this amount is all paid to shareholders, in the form of annual dividends. The present discounted value of this stream of cash is given by (assuming an interest rate of 100r%)

$$\$V = \$D/(1+r) + \$D/(1+r)^2 + \$D/(1+r)^3 + \dots$$

High school algebra reduces this to a simple formula:

$$\$V = \$D/r.$$

Hence, if the interest rate is 10% and the firm can pay \$1 million in dividends to its shareholders, the value of the firm should be \$10 million. If there are 500,000 shares outstanding, then the shares of the firm will be worth \$20 each.

In practice, firms rarely pay out all profits in dividends. Many do not pay dividends at all. The reason is that the 'retained earnings' can be plowed back into the firm to increase future profits. This makes estimating the value of the firm harder. It is easy if a firm has a steady track record, to forecast that it will earn a steady level of future profits at about its historical level. It is much harder to forecast growth. If the forecast is overoptimistic, it can lead to much higher valuations of the firm, and hence to 'inflated' market values. This is what is behind the 'dot.com bubble' in stock prices in the early part of 2000. Sometimes, what matters is what other people think, and not one's own expectations. As long as you are not among the last ones out of the stock, it may be profitable to bet on others' optimism, but that is a risky game, as many dot.com investors discovered in the Spring of 2000.

Once a firm is listed on a stock exchange, it may still issue more shares, or it may offer to buy them back from the public. In general, however, the bulk of the trading is done by firms that specialize in managing portfolios of assets for individuals (including mutual funds, brokerage houses, insurance companies, and pension funds), and, increasingly, directly by individuals themselves, thanks to low-cost online trading. While all this trading may seem to be irrelevant to the primary need for firms to raise capital for their ventures, it is the possibility of buying and selling at any time, the possibility of converting one's risky investment in the enterprise to cold cash, that makes the initial raising of funds by firms possible. Trading in existing financial assets makes the raising of new finance more efficient, as well as providing a disciplinary device for the managers who run the firms whose assets are traded.

Types of Exchanges The first, rudimentary stock exchanges followed on the heels of the development of ‘joint stock’ companies (the precursors of our modern corporations) in the seventeenth century. Early exchanges were places of wild speculation, and governments have always tried to keep them under some kind of control. The Wall Street crash of 1929 was at least partly due to a lack of adequate rules governing stock trading. Modern financial exchanges, especially in developed countries, are much more likely to emphasize transparency and consistency than the exchanges of the past.

The main type of financial exchange, and the one which will be our main focus, is the stock exchange. The ownership shares in firms that we have described briefly above are traded on stock exchanges. The main exchanges in the US are the **New York Stock Exchange (NYSE)** and the **National Association of Securities Dealers Automated Quotation (NASDAQ)** system (the latter does not have a central location, as we explain below, so is not an exchange in that traditional sense). These two exchanges have very different histories, but technology has recently pushed them closer, as we describe below. Almost all major corporations are ‘listed’ on one of these two exchanges, which means they must satisfy certain requirements about publicly reporting financial information (though mostly these are mandated by the Securities and Exchange Commission, or SEC, which is an independent regulatory body empowered by the US government to regulate all financial asset markets).

There are other exchanges on which stocks may be listed or traded. All developed countries and many developing countries have their own stock exchanges for listing their domestic stocks. Foreign stocks may be traded on a US exchange as well as on their home exchange, provided they satisfy US regulatory requirements. Trades for NYSE stocks may be executed at regional exchanges as well. Finally, there are various **electronic communication networks (ECNs)** that link to the exchanges. These include Archipelago, The Island ECN, and Instinet, which is the largest ECN. ECNs provide greater automation, and additional matching possibilities. We discuss them further below.

The desire to create additional ways of managing risk and exposure to risk has led to a wide variety of financial assets that are not direct claims on the resources or future profits of firms. Instead, these assets have returns that depend on the values of the underlying assets. For example, a firm (or an individual) may wish to protect itself against the risk that a stock in its portfolio will go down in value, but without sacrificing all the potential for positive returns that would result from selling the stock. It can buy what is called an ‘option’ to sell the stock at a fixed price. If the stock price goes below this fixed price, then the option can be exercised, and the firm has avoided some loss. If the stock price stays high, the option is useless, but that is the price paid for the protection. Another kind of ‘hedging’ could be agreeing to sell the stock at a future date for a fixed price. In this case, there is no option – the firm’s commitment is unconditional – but the contract again prevents the firm from facing some risk. All these kinds of contracts are called **derivatives**, and they themselves are financial assets that can be traded. The underlying items of value need not be financial assets, but could be real commodities, such as oil, wheat, or pork bellies.

The main futures and options exchanges in the US are the Chicago Board of Trade, the Chicago Mercantile Exchange, the Chicago Board of Options Exchange, and the American Stock Exchange (AMEX). Futures and options exchanges also exist in many other global financial centers, including London, Tokyo and Hong Kong.

Finally, bonds are traded on exchanges such as the Chicago Board of Trade, but much bond trading has traditionally taken place between large institutional investors, and Wall Street firms such as Salomon Brothers acted as market makers. Thus the institutional apparatus of bond trading has been much less formal than that for stock exchanges. The number and frequency of bond trades was not of the same level as stock trading, and there was not large scale direct participation by households in the bond market. One of the consequences of the structure of bond trading was a substantial capture of value by bond trading intermediaries. The openness of the Internet has the potential to change bond trading dramatically as it moves online.

Types of Trading Institutions The two main stock exchanges, NYSE and NASDAQ, illustrate two basic trading institutions. The NYSE is order-driven. Buyers and sellers make bids and offers, and traders called **specialists** match these requests. This is thus akin to an auction market. Since both sides of the market are making bids (where we use that term now for sell offers as well), and these are coming in all the time the market is open, it is a **continuous double auction** market. The NASDAQ, on the other hand, was traditionally a quotation-driven market. NASDAQ dealers post offers to buy and sell (bids and asks), and buyers and sellers respond to these. Thus the NASDAQ market is a variation of the posted price model.⁵ In an analogy with posted price retailing, it is often called the ‘over-the-counter’ market. In either case, the trader who acts as an intermediary between buyers and sellers ‘lives off the spread’, making money on the difference between the buying price and the selling price. We now provide a few more institutional details for these two markets.

The NYSE had its beginnings in meetings under a tree in lower Manhattan, and it still has a central location for trading. Specialists man trading booths on the NYSE floor, where they act as market makers for the stocks in which they specialize. Brokers bring in buy and sell orders to specialists, and may even quickly negotiate transactions on the floor. Most transactions are directly between the buyer and the seller, with the specialist playing somewhat of a refereeing role. If there is an imbalance between supply and demand, the specialist may buy or sell the stock to maintain an orderly market. If things get too wild and woolly, trading may be temporarily halted.

Specialists and brokers are employees of financial firms that are members of the NYSE. They pay membership fees to the NYSE, and those who trade on the floor must satisfy minimum individual qualifications as well. Brokers act as agents for buyers and sellers. The broker on the NYSE floor has typically received the order via another

⁵ Since the posted prices are also adjusted with great frequency, the practical difference between the NASDAQ and NYSE institutions may be less than the formal descriptions suggest.

broker, in a front office, who directly interacts with corporate and individual customers (the buyers and sellers). The broker should ideally get the best deal for his or her client. The specialist is neutral, and mainly provides a record-keeping and balancing (or smoothing) role. The specialist also sets the daily opening price for the stocks in which he or she trades, which begins the 'auction' for that day. In some circumstances, specialists may act as agents for brokers, executing specific trading instructions.

The NASDAQ is a large network of over 500 financial firms, called Market Makers, that act as securities dealers. They commit to displaying buy and sell quotes in NASDAQ-listed stocks. They have equal access to NASDAQ's trading system, which broadcasts their quotations simultaneously to all market participants. They provide capital support and smoothing functions in much the same way as specialists do for the NYSE. The differences are that all can simultaneously make markets in all stocks, and prices are posted by them, rather than being directly determined through bids and offers. Of course, ultimately prices are determined by supply and demand (willingness to accept and willingness to pay), but the differences in matching methods and information flows can lead to differences in price determination.

In 1994, for example, an academic study by two financial economists found that NASDAQ dealers avoided quoting stock price bids and asks in fractions such as $1/8$ and $3/8$ ('odd-eighths'), even though they were permitted to. This had the effect of widening bid-ask spreads and the value captured by dealers. The price posting thus appeared to support a form of tacit collusion. While this charge was never formally proved, NASDAQ did change its ways. Quotes are now in sixteenths, allowing for narrower spreads. Since 1997, following new SEC guidelines, NASDAQ has also used new order handling rules which require certain customer limit orders (specifying limits on the price at which the customer wishes to buy or sell) to be displayed in quotes. Hence, NASDAQ now has quotation- and order-driven components, making it a hybrid of the two forms.

Since at least the 1980s ECNs have also linked to NASDAQ, and they play many of the same roles as NASDAQ Market Makers. They display quotes and execute trades. They use proprietary technology and a high degree of automation. Direct access to these ECNs is limited to financial institutions and to securities professionals such as institutional fund managers, brokers, dealers, and exchange specialists. While ECNs are not exchanges in the conventional sense, they provide purely electronic marketplaces that both compete with and cooperate with the traditional exchanges. Thus orders from an ECN such as INSTINET may be routed to NASDAQ and fulfilled by Market Makers there, or they may be met within INSTINET itself. A key economic point to note here is that compatibility and interconnection mean that multiple exchanges or trading networks can exist and flourish side-by-side. Dominance by one exchange is not a necessary outcome. This point will be relevant in examining online exchanges for physical goods, ranging from C2C auctions for collectibles (eBay, Amazon, Yahoo) to B2B procurement exchanges.

Finally, we note that haggling also plays a role in financial market institutions. In general, the value of time is too high for much haggling, but brokers on the NYSE floor

will negotiate where an order is large or a client is important. On the NASDAQ, an alternative system for block trades, called SelectNetSM, provides an electronic mechanism for negotiating over large orders. SelectNet allows Market Makers to communicate orders or offers to one or more other NASDAQ firms. Negotiation is screen-based, and offers can be countered in any way the other party desires. Once agreement is reached on the terms, the deal is locked in and executed.

Payment and Clearing Systems Settlement of transactions can relatively easily be automated through electronic messaging and payment systems, and clearing house systems. Even in consumer markets, electronic settling of accounts has for decades been a part of payment systems using credit cards, debit cards, ATMs, and prepaid cards. Non-cash payment mechanisms are settled by adjusting the appropriate accounts between banks based on payment information. As one can imagine, the fast-paced world of financial transactions has sophisticated and rapid payment and clearing systems. These are integrated into the services provided by the exchange itself.

All exchanges have automatic payment and clearing systems. Once a transaction is agreed, it is entered into a computerized system that will automatically register it, updating the records of both parties to the transaction, and feed it into a clearing system that balances all the transactions at the end of the day. About the only pieces of paper involved in a stock transaction will be the order tickets filled out by brokers in retail branch offices, and trade confirmations, which are mailed to both the buyer and seller immediately after the trade is executed. The confirmation includes details of the trade, such as price, number of shares, and terms and conditions, and is required by SEC regulations (see Section 3.4).

In addition to reducing transaction costs by performing a net clearing and payment at the end of the day, instead of requiring individual payment for each of thousands of transactions, clearing systems also provide a degree of insurance. The clearing system bears the risk of a trader being insolvent at the end of the day, and takes the loss, rather than the potentially numerous counterparties of that trader. This provides an additional reason for restricting exchange trading to individuals with sufficient financial resources and training.

7.8 Conclusion

From medieval town markets for farm produce, to global networks of electronic trading of complex financial assets, market organizations display an enormous amount of variety. The purpose of this chapter has been to map out this variety, and identify some general features and potential problems for the working of markets. Important considerations in market organization are: who can participate, what they can or must do in terms of following rules for reaching an agreement, and how agreed-on transactions are completed. All these details of institutional organization lie behind the simple supply-demand model of introductory textbooks. While many of these details do not matter in understanding the workings of established markets, they are crucial in thinking about how new e-commerce exchanges for businesses and consumers will operate.

Existing formal markets, such as those for financial assets, will change, and formal market exchanges will arise where markets have been fragmented and governed by informal norms, such as for many business procurement situations. The institutional details of market organization will be crucial in such cases.

Summary

- Markets can be characterized by geographic scope, the range of products traded, and the timing of their operation.
- Market institutions will involve one or more of three basic methods of price determination: haggling, posted prices, and auctions.
- As products and services, and hence markets, grow in complexity, institutions must arise for dealing with performance by sellers and payment by buyers.
- If sellers are better informed about individual product quality than buyers, markets may not function well: informational intermediaries and incentives created by possibilities for repeat contracting both play a role in mitigating this problem.
- Intermediaries may play other roles in making markets work, including reducing transactions costs in general.
- Financial markets provide sophisticated examples of basic market types: auctions, posted prices, and haggling are all used under different circumstances. There are rules for trading, rules for who may directly participate, and rules for how transactions are completed and settled.

Questions

1. Is there a market for oil? How is it related to the market for the gasoline that you put in your car? How would you describe your local market for gasoline in terms of pricing rules, payment rules, and scope?
2. Give a specific example of a market with each kind of pricing rule: haggling, posted prices, and auctions, excluding the examples already given in the chapter. Try to explain the economic reasons for using the particular method in each case.
3. The market for used cars functions despite the potential lemons problem. Consider how it actually works, and try to explain how particular institutions, such as used car dealers, help it to function.