

## Inside the Firm

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- I. Organizational boundaries (I will cover only the highlights here)

We have examined how markets determine prices subject to the forces of supply and demand. Markets result in highly efficient resource allocation. For instance, if corn prices fall and soybean prices rise, then farmers plant more soybeans and less corn while at the same time consumers demand fewer soybeans and more corn. The signal to increase or cut back on output cannot get easily channeled in a planned economy, especially when prices are not flexible. Some parties may observe data on surpluses of corn and shortages of soybeans, but when will they act on such data and how much will they react? Why should they react at all if they do not have an ownership stake?

### A. Advantages and disadvantages of market-based transactions

Given the advantages of market-based transactions, one must wonder why one needs firms at all. After all, if markets create the right incentives for resource allocation, why do we need CEOs and division chiefs to issue orders and boss folks around?

One WRONG answer is to claim that firms are necessary to take advantage of technological opportunities. The reason this is incorrect is that most goods can be produced without any firms at all. Want a computer? Buy the casing, motherboard, disk drives, monitor, and the like and put it together yourself! Want a vacation? You don't need a travel agent! Just get on the phone, fax, or net and call a bunch of airlines, hotels, and car rentals. (Of course the cost of building a computer on your own is likely to be a lot higher for most of us than the cost of buying one from Dell.)

In fact before 1850 most goods were produced by artisans on a small scale. Things changed after 1850 as new sources of power created economies of scale, telegraph (and later telephone and email) lowered communication costs, and the railroad (and later trucks and airplanes) lowered transportation costs.

Once you start thinking about substitutes, it becomes very clear that there are lots of alternative ways of organizing the production process. Examples:

- 1) office supplies – should each operating unit buy its own or should there be centralized purchasing and distribution?

- 2) labor – Need some extra help? What should you do? Contract out? Temps? Permanent employee?
- 3) materials used to make cars – why do auto manufacturers buy tires and cloth for upholstery, but make their own engines?

How can we tell what types of transactions are handled by market exchange and what types are handled by command decisions within firms? Professor Ronald Coase of the University of Chicago Law School earned a Nobel prize in economics for pointing out that a key factor is *contracting costs*. All economic transactions – whether handled within the firm or in the market – involve the following transactions costs (for more detail, see the article by Margolis):

- 1) Search and information costs: who sells what goods at what price and quality? (Use market when costs very low; otherwise may need to think about long-term contract or in-house production)
- 2) Negotiation and contracting costs: many transactions are not simple exchanges of goods for cash; need to establish terms and conditions (Market makes sense for simple transactions; contract for transactions where most conditions can be pinned down; firm: all other cases)
- 3) Policing and enforcement costs: what happens to make sure that the other party complies with the contract? (Market: you must rely on concerns about reputation, threats of loss of business, threats of litigation; firm: more leverage over employees than contractors, lower costs for resolving disputes (no litigation necessary))

The HBS note on “Market Failure” does a good job of specifying the situations where market transactions are costly (Fig. 1, p. 2). Market exchange with another firm is costly when (1) it is costly to find a trading partner or (2) it is hard to be confident that your partner will not try to take advantage of you. Here are some situations where your firm could be vulnerable:

- 1) Contracts are costly to write: Generally when we send in a purchase order or swipe a credit card, we feel secure that the goods or services that we expect in return will be delivered satisfactorily. But this should not be taken for granted! Some situations where contracts are costly to write:
  - Long-term relationships in dynamic settings: When the decision was made to build what is now the RBC Center, the project was much smaller in scale and involved NC State, Wake County and the City of Raleigh as the main stakeholders. But two things happened before much earth was turned: (a) it became very clear that the project would be much more economically viable if it had luxury boxes and (b) an NHL team arrived on our doorstep. It was not in anyone’s interest to stick to the original contract and there needed to be mechanisms to redesign and reprice the project. Once completed, there still have been numerous disputes to settle, e.g., naming rights, were the seats red enough? The building did get done in time, but there were many instances where the tenants thought the builders were trying to take advantage (and vice versa). Some firms manage their own building projects to avoid getting into such messes.
  - “Relationship-specific” investments: Buyers and sellers often have to invest in each other upfront, knowing that this initial investment could turn out to be wasted if the relationship does not work out. Examples: developing and installing software for supply chain management; workers receiving specialized training in

skills that cannot be used outside the firm; installing specialized equipment to meet the needs of a particular buyer. Promises can be made before the investments, but will they be kept? Contracts can help, but they are not a cure-all. (More on this later.)

- Ambiguous property rights: Contracts can work fairly well for tangible assets – buildings, equipment, land, etc. But most key assets today are intangible, e.g., contact lists and intellectual property. Firms can try to protect themselves against key employees running off to another firm (or starting their own) with non-compete agreements, but these are often difficult to enforce. If your IP is not well protected by copyright or patent, you run the risk that someone else (including those offering financing) will take it.
- 2) Contracts and property rights are not enforced: This is taken for granted in the US and Western Europe, but it is not taken for granted in many parts of the world. Suppose Venezuela’s President Chavez tries to woo American companies, asking them to locate manufacturing facilities there. Suppose further that the financial terms in his contracts are very attractive. How many takers will he have, given widespread corruption and the absence of an independent judiciary?
  - 3) One party has better information than the other: HBS cites the well-known example of used cars. The same point applies to these situations: a firm pays a premium to acquire a company but it does not know that it has just lost three key executives; a retailer promises better sales (but says nothing about customer service); a stockbroker touts XYZ as a solid buy but has just sold all of his shares. Contracts can deal with these issues some of the time, but will not always provide sufficient protection.

Because of these concerns, firms often choose to not use the market, and instead handle certain transactions internally. A coal-fired electricity generating plant may decide to own its own coal mines; a computer maker may decide to sell to customers directly. The choice between using the market versus internal transactions will be heavily influenced by which method minimizes transaction costs. (This is not to say that everyone in every large company is one big, happy team that always works together; we all know better than that!)

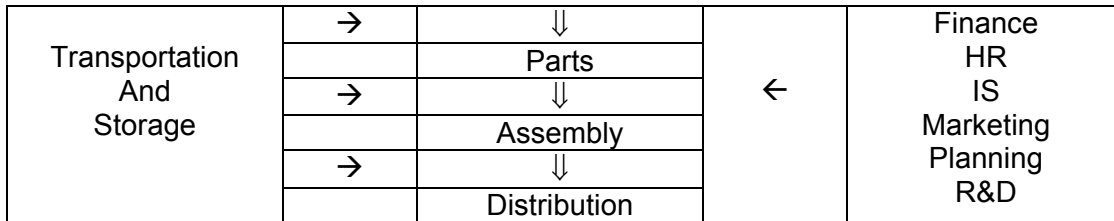
This sounds so convincing that we might start wondering now why there isn’t one big firm? Remember that firms face contracting costs as well. As a firm grows, the cost of making decisions rises because

- 1) The firm becomes slower to respond to new information
- 2) Top decision makers become increasingly unlikely to have the info they need to make effective decisions
- 3) Decision makers below the top tier lack the incentive to make fully effective decisions

**B. Vertical integration**

1. Vertical chain of production

		<b>STEPS</b>		<b>SUPPORT</b>
		Raw materials		Accounting



For instance, in automobiles, raw materials include steel, glass, rubber, plastics, and the like. These then become transformed into parts – frame, body, engine, tires, dashboard, stereo, etc. – which are next assembled into a car. The last step is matching the car with a customer. Auto companies do not get involved with raw materials or the final sale to the customer. They produce some parts themselves (engines, body) but not others (tires). Some firms produce their own stereo equipment, whereas others buy from outside suppliers.

In computers, where is IBM? Dell? Intel?

Now its time for a few definitions:

*Vertical integration:* Firm participates in two or more adjacent stages of the vertical chain. This can happen in one of two ways:

a) *Backward integration:* Firm produces its own inputs. Examples: GM buys Fisher Body in 1920s; most paper companies are also in the pulp business

b) *Forward integration:* Firm moves closer to final customer. Examples: Intel starts selling motherboards; IBM starts to sell PCs directly to households and businesses

A related phenomenon is *outsourcing*, which involves removing a step in the production process or eliminating a support function. Examples: Kodak outsources computer services to IBM; most big name designers outsource their manufacturing; many firms outsource logistics and transportation

## 2. When spot markets do not work: the role of firm-specific assets

Companies can obtain products or services from three possible sources: spot markets, long-term contracts, or vertical integration. Under spot markets the firm buys the product or service from any of a large number of potential suppliers with no commitment for repeat purchases. Cash is exchanged for goods, end of story. For instance Ralph Lauren can contract with any of literally thousands of manufacturing companies across the globe to produce his trademark Polo shirts. The commitment under a spot market arrangement would be to deliver a given number of shirts that meet a given quality standard at a given price on a given date.

Alternatively, Ralph can agree to a long-term contract with one supplier to make his Polo shirts or decide to have his own manufacturing facility. What factors would be most likely to make him avoid the spot market?

a) *Firm-specific assets:* the issue here is whether the equipment, facilities, and skills needed to make Polo shirts for Ralph have any alternative use. If a plant in

Guatemala can make shirts for Calvin Klein just as easily as it can make them for Ralph, then there is nothing locking either party into the transaction. On the other hand if specialized resources are needed to make Polo shirts for Ralph that have no alternative use (other than black market Polo shirts!!), there could be issues.

To see why, consider the following example. Suppose Montoya Manufacturing in Guatemala needs to spend \$50,000 to install a machine that will sew the Polo logo on each shirt and that it costs \$1 to sew the logo on each shirt (thread, energy, labor, etc.). Further suppose that Ralph buys the shirts from Martinez Manufacturing, and that all it needs for Montoya to do is sew the logo on. Ralph tells Montoya that it wants 100,000 shirts and will pay \$2 each. Montoya eagerly awaits a nifty \$50,000 profit (\$200,000 in revenue minus \$150,000 in costs). What can go wrong here? One risk is that once the new sewing equipment has been purchased and installed, Ralph will say "Oops! Looks like the market for Polo shirts is taking an unexpected hit. I can't pay you \$2.50 any more, but I can pay you \$1.25." At this stage Montoya's options are not good: (1) tell Ralph where he can stick his shirts and get nothing (thus losing \$50,000) or (2) grumble and accept Ralph's offer (and lose \$25,000).

If Montoya is the ONLY firm with sewing equipment that meets Ralph's specifications, the opposite problem can occur. Montoya can claim "unanticipated operating expenses" and jack up the price to \$3. If Ralph does not have any alternatives, he will have to pay up.

This example is an illustration of something economists call the *holdup problem*. Once a specific asset is in place, both sides have leverage to change the terms of the deal. This is why we would not expect spot market transactions in situations where there are firm-specific assets involved. Instead we would expect long-term contracts (where there is a threat of the loss of future business) or vertical integration.

Types of firm-specific assets:

- Locational specificity: asset that serves a limited number of buyers or suppliers and cannot be moved easily (e.g., electrical generating plant located next to coal mine, Alaska pipeline)
- Physical-asset specificity: design of asset limits its usefulness to a small number of buyers (e.g., die to make Mercedes hood ornaments, machine to sew Polo logo)
- Human-asset specificity: specialized training of employees that becomes valueless if a particular buyer or supplier is lost (e.g., Toyota trains employees to be consultants to improve operations at its suppliers, specialized knowledge about preferences of big accounts at any company)
- Dedicated assets: firm invests in much more capacity in order to be able to serve a particular customer (so much more that if it lost the customer it would have massive amounts of excess capacity)

**BOTTOM LINE:** whenever firm-specific assets are involved in a transaction, avoid the spot market! Negotiate a long-term contract or vertically integrate instead.

- b) *Quality control:* in most cases buyers cannot immediately and costlessly determine if goods purchased meet quality standards. Because of this, some suppliers in spot market settings may respond by cutting corners.

Going back to our Ralph Lauren Polo shirt example, how does Ralph know if the Polo logo will unravel after the first spin in the rinse cycle? One option is inspection, and if this can be done at very low cost, then a spot market transaction might be logical. Another possibility is that the supplier offers a warranty or has a strong reputation, and stands to lose too much if it starts cutting corners. But clearly another advantage of long-term contracts and vertical integration is economizing on the costs of monitoring quality.

Aside: the same point applies to distribution channels. Taco Bell and other fast food companies have huge investments in brand name and reputation. But an individual store owner might be tempted to cut corners on ingredients to make more money. If it is difficult to monitor this behavior, then you do not want to bid out store operations to the low bidder every month!

- c) *Extensive coordination*: some production processes involve extensive coordination. For instance look at the operation of spoke-and-hub networks at airports. As chaotic as these networks are right now, imagine what would happen if each airline used a spot market to obtain maintenance, baggage handling, and other critical functions. Also, connecting passengers usually stay on the same airline or move between airlines that have a strategic alliance (like Comair and Delta). A spot market for connecting flights would make the current situation look like a picnic.
- d) *Guarantee supply and lock-in cost*: sometimes shortages can occur, which imply rationing and increased costs. For firms that have adopted just-in-time production models, these costs can be devastating. In such situations, it would be foolish to rely on spot market transactions for critical inputs.

### 3. Contracts vs. vertical integration: the role of uncertainty

So far, we have indicated situations where long term contracts or vertical integration are preferred to spot markets. Let's now turn to when you should use long term contracts and when you should use vertical integration. (Long-term contracts include the following: supply contracts, joint ventures, lease contracts, franchise agreements, strategic alliances.) A key point to recognize is that *almost all contracts are incomplete*. A complete contract would (1) have terms that spell out what happens in every possible situation and (2) would be enforceable. Most contracts are incomplete because

- It is very difficult to anticipate all possible situations
- It is costly to reach agreement on what would happen in each possible situation
- It is costly to write precise language reflecting the agreement

As a consequence, most contracts are left incomplete – many contingencies are ignored and left to future negotiation should the need arise.

Needless to say, an incomplete contract opens the door for opportunistic behavior. If a long-term contract is written in an environment where there is relatively little uncertainty about such key issues as customer demand, technology, input prices and availability, then the odds for opportunistic behavior would be fairly low. On the other hand, if there is lots of uncertainty in these dimensions, vertical integration is a more logical approach.

The following table sums up the key implications of our discussion of vertical integration:

	Uncertainty		
		Low	High
Asset specificity	Low	Spot market	Spot market
	High	Long-term contract	Vertical integration

Cases to consider:

- 1) Why do companies commonly outsource landscaping?
- 2) When would it make sense to outsource manufacturing? Why does Dell do this and GM does not?
- 3) Why do auto manufacturers buy radios and tires on contract, but make their own engines?

#### 4. Other factors

We have emphasized firm-specific assets and uncertainty as key factors that determine the magnitude of the transactions costs of using the market. When those costs are sufficiently large, we expect to observe vertical integration or some sort of long-term contract. Here are some other factors that influence this tradeoff:

- Economies of scale: these may be difficult to obtain with in-house production. By outsourcing certain activities or functions, the firm lowers cost.
- Market discipline: in many firms inefficient or underperforming units can stay afloat because of the overall success of the enterprise. Outsourcing forces these units to become more efficient
- Private information: your partners today may end up being your competitors a few years later. Be careful who you contract with and write tight non-compete agreements into long-term contracts
- Monopoly profits: we do not have the tools to develop these arguments at this stage, but it is possible in some circumstances for firms to obtain monopoly profits through vertical integration. One option is to extend a monopoly at one stage of the production process to an adjacent stage; another is to use vertical integration as a mechanism for price discrimination.

Some bad arguments on vertical integration and outsourcing:

- 1) "We can eliminate the cost of (fill in the blank) by outsourcing it." (You get outsourcing for free?)
- 2) "We should vertically integrate to avoid padding the profit margin of someone else." (All resources have alternative uses; are you really better off using your own staff for (fill in the blank) or could they give you a bigger payoff in an activity closer to your core competency?)

#### C. A brief aside on conglomerates

Some firms are involved in more than one line of business. For instance Sears sells tires, clothes and insurance, along with many other goods. This can result in gains in efficiency if there are cost savings by having two units in different businesses combined under the same corporate umbrella. For instance, marketing expenses for auto repair service might be lower if the auto repair operations can get some leverage from the Sears brand name. We will talk about this issue more when we get to *economies of scope*.

Alternatively, the support functions of a firm might gain economies of scale if they start to serve a broader base. Two HR units of 20 persons each might become one unit of 30.

II. Case discussion