

## 12. Pricing

Contracts embody price rigidity. Coase says that the firm is the suspension of the price mechanism. So too are contracts, especially long term contracts. However, most long term contracts include terms that call for price re-negotiation. Why? Why is it inefficient for contracts stipulate terms that are not exactly equal to the market conditions?

There are a couple of reasons:

- 1) Proper short-run price signals.
- 2) Reductions in the incentives to breach or act opportunistically.

Furthermore, including re-negotiation terms in the contracts reduces the amount of pre-contractual search that is undertaken, search for information that will be the free by-product of commerce as it unfolds. To the extent that price re-negotiation can be effectively included in the contract, it is a form of post-contractual settling up.

### *Fisher Body*

Recall the price issue associated with the General Motors / Fisher Body contract. GM signed a bad contract. Because of an unexpected increase in sales, the price that GM was committed to pay to Fisher was way out of line with the marginal cost of production. GM renegotiated the contract, which finally resulted in the merger of the two companies. GM renegotiated the contract because given the price that GM was bound to pay Fisher based on the original contract, GM was producing autos inefficiently and wasting profits as a consequence.

This point is both subtle and profound. The contract forced GM to pay the Fisher brothers a lot of money. The contract was a big mistake. Because of it, the Fisher brothers got a large portion of the entrepreneurial rents that were rightly due to GM. But luck is luck, bad or good; and the contract once signed was a sunk cost. Even so, GM had managerial discretion and some flexibility. Based on a high price for car bodies, GM could minimize the payments going to Fisher and maximize the profits that it enjoyed by relatively reducing the composition of the car made up of the components supplied by Fisher. That is, the profit maximizing strategy for GM given the Fisher contract was to put in bigger engines, nicer upholstery, and better wheels. They also maximized profits and minimized the payments to Fisher by charging more for the car. However, when the contract was renegotiated, this changed, and total profits were higher, even counting the fact that the Fisher brothers had to be paid off.

It is worthwhile to think of this situation like a patent. The Fisher brothers lucked into a contract in which GM promised to pay them, let's say, \$300 per car body when the true marginal cost was \$100. However, this \$200 difference was per the number of cars that GM chose to produce. Instead of charging a "royalty" of \$200 per car body that GM used, Fisher was better off charging \$100 per car body and something like a \$100 "tax" on every *automobile* that GM sold to the public. The \$100 tax does not distort GM's decision making, and therefore maximizes the total amount of profit available to be split between GM and Fisher. (The exact amount of the royalty *à la* tax depends on the supply and demand conditions. In the Fisher-GM case, the negotiations culminated in a lump sum buy out.)

### *Price re-negotiation in Natural Gas*

Natural resource contracts especially in petroleum offer another sharply focused case study on the value of price re-negotiation. Natural gas contracts during the period 1940- 1954 were long term. Long-term contracts are subject to significant price variations during the life of the contract. Contracts of this sort typically allow for price re-negotiation.

Why renegotiate price in natural gas fields? First, price changes affect the optimal extraction rate. A natural gas contract specifies an extraction rate and price per unit. If the market price increases, the efficient thing to do is to increase the production rate. Two problems are created. First, the well owner has no incentive to increase production at the contracted price because he doesn't share in the gains. Second, the well owner has an incentive to reduce output to save the gas for sale at a higher price when the contract is terminated. At the same time there is an incentive to drill more wells, which may or may not be the efficient form of extracting more gas.

One contractual solution to this price fluctuation problem is the inclusion of a *most-favored-nation* clause in the contract. The MFN clause says that the well owner gets a price that is equal to the highest price paid to any well in the field. On the basis of agency cost considerations, we expect the probability of the MFN clause increases as the length of the contract increases. Also, we expect we expect that its probability declines as the number of pipelines increases. Both of these predictions are found to be supported by the data in Mulherin's work.

### *Take-or-Pay*

On the other side of the natural gas contracting problem, pipelines can holdup wells by refusing to take the contracted amount of gas. Since wells in a field pump from the same reservoir, if the pipeline refuses the gas of one well, its gas is lost to other wells. The take-or-pay provision requires that the pipeline pay for a given amount of gas regardless of whether the gas is taken. The rate of depletion is specified in the contract. We expect that the rate of depletion will increase with the number of wells in the field. More wells, more risk to anyone from holdup by the pipeline. We expect that the rate of depletion will fall as the number of pipelines in the field increases. More pipelines, less cost imposed by holdup from any one pipeline. Mulherin and Scott & Masten find this is true.

Take-or-pay provisions are also common in the petroleum coke industry. Goldberg & Erickson describe the nature of these arrangement. Recall that the major problem in the coking industry is the provision of inventory facilities for the green coke. If the refiner (green coke producer) does not have adequate inventory facilities, it must shut down production. Hence, there is the problem of opportunistic behavior on the part of the buyer (who is usually a calciner). The contracts between cokers and calciners commonly include take or pay provisions.

The take-or-pay provisions in the petroleum coke industry studied by Goldberg & Erickson were more complicated than those in natural gas. This was especially true in the contracts between the aluminum companies that backward integrated into calcining and the refineries. Several contracts were discussed. In every case the contract was an arrangement between a coker and a calciner that were of approximately matched size. That is, the calciner, usually located at or near the refinery, obtained all of its green coke from the refinery but was responsible for the removal of all the green coke produced by the coker.

In one, Alcoa bought green coke from Gulf. Gulf had the right to shut down if the inventory of green coke reached twenty days' output, at which time, Alcoa was forced to pay a "standby" charge of \$75,000 per month. This was roughly a take-or-pay provision for 40 percent of the normal volume of sales between the two. In an Alcoa contract with another coker, there was no shutdown or standby charge. However, Alcoa got a better price for coke the more it bought. In both of these examples, we see a balancing of the cost imposed on the coker when inventories curtailed coke production and the value to the aluminum company from flexibility in production. In the Gulf contract, Alcoa was only obligated to cover 40 of the shut down costs it might impose on Gulf. In the other, where alternative inventory removal at a higher price must have been available, Alcoa was encouraged by price to take more coke.

One last example serves to illustrate the point. In a contract between Humble Oil and Reynolds Aluminum, Reynolds agree to take green coke (on a yearly basis) benchmarked to its output of ingot aluminum. As its ingot aluminum fell, its required coke purchases fell. The proportion was .78 tons of coke per ton of aluminum. In the event of complete shutdown, Reynolds was obligated to pay 50 percent of the baseline contract. The contract also gave Reynolds a price discount if its purchases of coke exceeded a given level (slightly lower than the benchmark). The implication of these contract terms is, again, a balancing of the costs of coker shutdown with aluminum production flexibility.

### *Price Indices and Price Renegotiation*

The contracting process was dramatically changed in 1973 by two events. Dramatic price volatility was caused by the Arab oil embargo and subsequent OPEC price cartel. In addition, the Federal Trade Commission handed down a ruling that forced significant changes in the contracting process in the industry. Specifically, the FTC proscribed all contracts of longer than 3 years.

During the decades preceding 1973, contracting was long term. Price renegotiations were built into the contracts, however. Indeed, the contracting parties could typically terminate after several months notice if price could not be renegotiated.

In the pre-73 period there was some reliance on price indices, and many contracts included indexes linked to crude oil prices. After '73, about half of the contracts used price indices and until '76 these were linked to crude prices. After '76, they were pegged to calcined coke prices. The implication is that indexes are good tools for price renegotiation if the index is closely linked to the fundamental of the industry and less good when this isn't true.

In the event of higher price volatility and mandated short-run contracts, the contracting parties opted for price indexes to smooth the price negotiation process. The short-term contracts were rolled over frequently. Again, where there were no specific assets this seems to have worked. Where the calciner had specific assets in place (exclusive contract, close to the coker) contracting became somewhat more problematic.

When the oil embargo sent prices sharply higher, all of the aluminum calciners were involved in long term contracts. In all but one case, these contracts, which strongly favored the calciners, were renegotiated. The calciners seem to have done this (given up some short-run rents due to the oil price increase) in order to protect their supplies of coke. In the one case where the calciner would not renegotiate, the coker, Richfield, leased the land on which the calcining plant was built to the calciner. At the end of the contract (around 1980), Richfield terminated the lease

and made the owner tear the plant down. It is claimed that this action represented a spite filled waste precipitated by ill will over the fact that the calciner would not renegotiate the price.

### *Commission Pricing*

One of the features of the petroleum coke contracts is the use of commission pricing in certain setting. Many of the small cokers sold their product to buyers who then resold the product. These middlemen were often paid on a straight commission. That is, the coker was paid a price for the coke that was based on the price at which the coke was sold to the next buyer.

Commission pricing is a common place in many settings, for instance, real estate. Commission pricing is said to minimize the amount of “wasteful” price searching prior to the contract. As stated above, to the extent that price information is revealed in the natural course of business, commission pricing may be efficient in this regard.

However, price searching is valuable and commission pricing itself creates a potential misalignment of incentives. Consider the case of the real estate agent. An agent signs a contract with an owner of property. The contract says that the agent will receive 7% of the sales price of the property. The contract does not give the agent any incentive to maximize the sales price, except that the agent gets 7% of any marginal increase in the selling price. Presumably, the real estate agent will urge the seller to take the first offer that comes along because it minimizes sales effort and thereby increases the value of the sale to the agent.<sup>1</sup>

Commission pricing in the coke case seems to have taken the form of sales of both green and calcined coke. That is, a calciner like Great Lakes Carbon buys green coke from a coker, calcines some, and sells some in the open market. On a commission basis, the coker is paid presumably on some formula that represents the price of green coke in terms of calcined coke. This seems like it would be an efficient contract to the extent that it can be verified because GLC has the right incentive to maximize the value of the coke in the calcined product that it manufactures and markets.

### *Fisher Body — GM Revisited*

The age old question in this merger is, Why merge? The conundrum in the Fisher/GM case is that the parties had a contract. It turned out to be the wrong contract ex-post. This created a winner (Fisher) and a loser (GM), but like the fortunes of love and war, there is no reason to look back. The implication is rewrite the contract and go on.

Klein gives us new info on this event that makes our understanding more keen and ultimately explains why the merger was necessary.<sup>2</sup> In Klein's view, the contract worked fine in its early days. However, it failed in 1925. From '19-'24, sales were such that the terms of the contract were about right. Everyone acted in the spirit of the contract. Indeed, on the most

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<sup>1</sup> It is not common to see leveraged contracts between property owners and real estate agents. It is not clear why. Possibly this is true because most home owners are not willing to wait long to sell their house. By setting a price in the pre-contractual negotiations with sales agents to about the right level, the home buyer simply holds out for this price and sells to the first buyer the agent can produce who will pay this.

<sup>2</sup> "Fisher—General Motors and the Nature of the Firm", Ben Klein, *JLE*, April 2000, 105-142. One thing that is brought out in this paper that is not analyzed is that the merger may have been monopoly inspired. Fisher was supplying bodies to Chrysler from the Detroit plant that is alleged to be the focus of the dispute. After the merger, Klein claims the Detroit plant was shut down. Presumably this put Chrysler at a competitive disadvantage.

contentious point after '25, the construction of new facilities, before '25 Fisher lived up to its implicit agreement. It built a number of new facilities and these close to GM plants.

However, in '25 demand surged. GM wanted Fisher to build a plant in Flint. However, Fisher continued to supply GM from a plant in Detroit. The reason was that the contract terms allowed it to earn more profits from this behavior than if it built the new plant. This is arguably an act of opportunism.<sup>3</sup>

Because of the change in conditions, this opportunism became profitable. It would have always been profitable to have not built the other plants, but these Fisher did build because reputation and the prospect of renewing the 10 contract made opportunism not profitable. Once Fisher acted opportunistically, re-contracting was not feasible.

Klein effectively argues that specific contracting requires reputational capital to make it work. In other words, every specific contract is backed either by an explicit bond or by reputational capital. Hence, if reputational capital goes to zero, as it will in the case of opportunism, then rewriting the specific contract is impossible.<sup>4</sup>

Where the gains from opportunistic behavior fall inside the returns to reputation, the contract will work. When the gains from opportunism exceed the return on reputation, the specific contract fails.

It is still my opinion that the Fisher/GM case hinges on price fluctuation and opportunism in the face of optimal price renegotiation. The plant location issue was an accelerator; by not building the plant, Fisher could make more money given the structure of the price formula in the original contract.

The Goldberg-Erickson story about pete-coke is similar. When the price of oil shot up, most calciners re-contracted with their green coke suppliers. Rather than taking short run profits by holding the cokers to the miss-priced contracts, they opted for the long run benefits of continued business relations. One didn't and that relationship ended bitterly with the expiration of the contract.

### *Futures Contracts and Price Fluctuation*

Consider AT&T Recycling, a wholly owned subsidiary of AT&T c. 1985. AT&T was dismantling its copper wired long distance network. The copper had significant salvage value. Each month, AT&T Recycling would receive loads of scrap copper wire. Based on well-known recovery percentage and production schedules, the amount of copper that would output the facility could be predicted. When the scrap arrived the company sold futures contracts on the product that would be ready at the end of the recovery process.

The question is why would a company as huge as AT&T sell futures contracts on the forthcoming recycled copper. It is silly to say that AT&T needed to hedge. The company self-insured almost all perils. Why didn't the company just sell on the spot market when it had significant inventory?

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<sup>3</sup> In this paper Klein draws an interesting distinction between a strong-form/weak-form definition of opportunism. Strong form is renegeing on the explicit terms of a contract. In this, the Fisher bros. (six of them) probably did not. However, the weak-form is renegeing on the implicit terms of a contract to the disadvantage of the other party where the other party has committed specialized resources.

<sup>4</sup> Of course, an explicit bond could be posted, but it would necessarily be more than the value of the original act of opportunism.

A likely answer goes as follows: It is very likely that AT&T sold most of its product to a few buyers. Selling to these few, possibly with their spec's in mind it could command a higher price than if it sold in the basic spot market. Also delivery costs were minimized.

However, by only selling to a few buyers, AT&T ran the risk of opportunism. Selling in the futures market reduced that opportunism. If the buyers unexpectedly refused delivery, AT&T could always deliver on the futures contract. If price went up and the buyers were reluctant to take all that AT&T had for delivery, the owners of the futures contract would be happy to accommodate. If price went down and the buyers angled for a special discount, AT&T could deliver in the futures market at a nice profit. No doubt, AT&T delivered only seldom, if ever, in the futures market, but the threat took away the opportunistic bargaining power of the buyers.

Two things: (1) See if this story is correct. (2) If this is generally true, then delivery in futures markets should increase with price volatility.