The Anatomy of a Price Cut: Discovering Organizational Sources of the Costs of Price Adjustment*

Mark J. Zbaracki
The Wharton School
University of Pennsylvania

Mark Bergen
Carlson School of Management
University of Minnesota

Daniel Levy**
Department of Economics
Bar-Ilan University
and
Department of Economics
Emory University

Last Revision: August 22, 2006

JEL Codes: E12, E31, L16, L20, M21, M31

Key Words: Organizational Rigidity, Organizational Cost of Price Adjustment, Menu Cost, Convex Cost of Price Adjustment, Sticky Price, Price Rigidity, Time-Dependent Model, State-Dependent Model, Colliding Partial Models, Organizational Complexity, Behavioral Theory of the Firm

* We would like to thank the participants of the INFORMS-Cornell conference on pricing research, and the seminar participants at the Carlson School of Management, Dartmouth, and the Wharton, for valuable comments. We owe a particularly long-term debt to Larry Ball, Bob Barsky, Susanto Basu, Andy Caplin, Steve Cecchetti, Mark Gertler, Anil Kashyap, Greg Mankiw, Ket Richter, Julio Rotemberg, Eytan Sheshinski, and Yoram Weiss, for their continuous encouragement and intellectual support on this line of research. The authors would especially like to thank Shantanu Dutta and Mark Ritson for all their efforts on this line of research. All errors are ours.

** Corresponding author: Daniel Levy, Department of Economics, Bar-Ilan University, Ramat-Gan 52900, Israel.
Email: Levyda@mail.biu.ac.il, Tel: +972-3-531-8331, Fax: +972-3-535-3180.

The Anatomy of a Price Cut: Discovering Organizational Sources of the Costs of Price Adjustment

Abstract

The fact that organizations find it hard to change in response to shocks in the environment is a crucial feature of the economy. Yet we know little about why it is so difficult for organizations to adjust, and where these limitations come from. In an effort to discover some of these reasons we ground ourselves in the context of price adjustment, and present a qualitative analysis of an intensive ethnographic field study of the pricing practices at a one-billion dollar Midwestern industrial manufacturing firm and its customers. We go into depth on a specific episode, a price cut, which most vividly exemplifies the themes that emerged from our data. In the specific situation, market forces clearly dictate that the firm should cut prices, and everyone in the firm agrees with this assessment, suggesting a fairly straightforward price adjustment decision. Yet when we look deeper, and dissect how the firm implemented the price cut, we uncover a rich tapestry of frictions hidden within the organization. At their core, these frictions relate to how managers, in the context of an organization, attempt to apply the fundamental elements of economic theory. Essentially they face a series of constraints that make sense in the context of an organization trying to make these adjustments, but constraints that are rarely articulated or incorporated into economic understanding of price adjustment. We discover that the largest barriers to price adjustment are related to disputes arising from collisions between "partial models" used by different organizational participants as they confront fundamental economic issues. Often, these issues have not been settled and exist in a tenuous truce within the organization – and adjustment requires the organization to deal with them in order to react to these changes.

1. Introduction

It is often difficult for organizations to adjust quickly and smoothly to changes in market conditions. For example, Caplin (1988) states that "Economists have given little thought to why it is so hard for groups to change from the status quo in the face of shocks to the environment. Yet the fact that institutions do change only slowly is one of the most crucial features of the economy."

Yet, the fact is that we still don't know great deal about why it is so difficult for organizations to adjust, or what the organizational sources and costs of adjustment really are. For example, Kashyap (1995, p. 269) emphasizes the weaknesses of the existing models of price adjustment because these models "… do not explain why these [price adjustment] costs exist in the first place." Similarly, Slade (1996, 1998) suggests the importance of studying price adjustment processes and empirically identifying and measuring their costs as a first step for understanding the reasons behind the existence of these costs.

In this paper, we ground ourselves in the context of price adjustment. In particular, the literature on the costs of price adjustment has been evolving toward an emphasis on these organizational components of the costs of price adjustment. Several authors and studies, for example, emphasize the organizational complexities involved in price adjustment, suggesting that it is a "… very difficult, costly and time-consuming process" (Caplin and Leahy, 1995), "… extraordinarily complex" (Dutta, et al. 2003), and that "… the price change process reveals a series of managerial activities of vast scope and complexity" (Zbaracki, et al. 2004, p. 518). That is because of the common belief that menu costs, if interpreted literally as the administrative or physical costs of changing prices—such as the cost of changing supermarket shelf price tags, may not be important enough at the macroeconomic level, even if they may be forming barriers to price changes at the level of an individual price setter.[1] The most recent example is Rotemberg (2005), who expresses the view that "… these administrative costs simply cannot be the whole story" (p. 830).

Many recent studies, instead, point to the managerial costs of price adjustment, and suggest that the managerial time and effort is likely to be a more important

[1] See, for example, Ball and Mankiw (1994), Blinder, et al. (1998), Carlton (1986, 1989), Carlton and Perloff (1996) Cecchetti (1986), Gordon (1990), Kashyap (1995), McCallum (1986), Prescott (1987), and Rotemberg (1987, 2005), among others.

component of price adjustment costs. For example, Ball and Mankiw (1994, p. 142) "… suspect that the most important costs of price adjustment are the time and attention required of managers to gather the relevant information and to make and implement decisions." Consistent with this line of thought, Mankiw and Reis (2002) and Ball, Mankiw, and Reis (2005), provide empirical evidence that modeling the price adjustment cost as the cost of managerial decision, yields a more plausible Phillips Curve relation.

The distinction between managerial thinking/decision costs and menu costs is important also for the debate on the best way of modeling nominal price rigidity. For example, Basu (2005), in discussing Dotsey and King's (2005) study, emphasizes the significance of this distinction by pointing out the implication of these costs for the debate on time-dependent versus state-dependent models of nominal price rigidity.[2] If it is the menu cost that forms a barrier to continuous price adjustment, then state-dependent models of nominal price rigidity are a better description of the world. If on the other hand, the cost of managerial information gathering and decision-making process is the lead cause of nominal price rigidity, then time dependent model might be a better description of what is going on in the market place.

Our goal is to discover sources of these organizational adjustment costs by "going native", living with the managers making price adjustment decisions within an organization. of price adjustment using unique data. The data is the qualitative component of an intensive ethnographic analysis of the pricing practices of a one-billion dollar Midwestern industrial manufacturing firm and its customers (the more quantitative analysis can be found in Zbaracki, et al. 2004). We combine three data sources, (i) open-ended ethnographic interviews, (ii) non-participant observations, and (iii) company data along with industrial engineering time studies.

We use the data to study the social forces that contribute to the organizational costs of price adjustment. Specifically, we study in detail a particular price cut episode that the company had to deal with. In the specific situation we study, market forces clearly dictate that the firm should cut prices, and everyone in the organization agrees with this assessment. Thus, we are focusing on a particular situation where on the surface of it, it appears that the managerial and organizational price adjustment costs ought to be low.

[2] See also Sheshinski and Weiss (1977, 1992, and 1993), and Blanchard and Fischer (1989).

When we dissect the firm's price cut decision-making and its implementation process, however, we uncover a rich tapestry of organizational frictions and barriers hidden underneath these processes. This "anatomy of a price cut" identifies multiple sources of organizational costs of price adjustment, and offers new perspectives on why it may be so hard for firms to adjust prices in response to market conditions. Many of these costs result from the depth, breadth and complexity of the questions organizational members need to answer to decide how to adjust prices. It turns out, however, the largest costs of price adjustment are related to deeper, more fundamental and potentially more protracted disputes arising from collisions between the "partial models" used by different organizational units and participants. We find that the economic models used by managers are coherent and consistent with the data, the analyses and the issues these managers face in their daily routines and activities. Yet their models are also partial and varying across groups within the organization. The analysis of the data reveals that when the price cut decision the firm faced was large enough, it forced these partial models to collide, forcing the managers to revisit points of contention on fundamental differences between these partial models that were formerly held in truce in the organization. Our findings also suggest that the organizational costs of price adjustment may be inherently convex in nature, although the extent of the convexity is moderated not just by the size of the price change itself, but also by the degree to which large price changes force the organizations to confront fundamental economic issues that have not been settled and exist in a tenuous truce within the organization.

The paper is organized as follows. In section 2, we briefly describe the data and the methodology. In section 3, we describe the economic forces that pushed the company towards making the price cut decision and analyze its implementation process with a particular emphasis on the organizational frictions the price cut created. In section 4, we discuss in some detail the lessons that we believe, follow from this case study. We conclude in section 5 by offering some caveats and a brief discussion of the generalizability of our findings.

2. Data

Our data come from a one-billion dollar US industrial manufacturer that produces various types of parts and equipment that are used in maintaining machinery. The

company, which is considered an industry leader in many areas of its operations, has over 35 production facilities in the U.S, Canada, Mexico, Latin America, as well as in Europe and in the Far East, and operates distribution centers in about four dozen counties.

In our study we focus on one division of the company. The division produces over 8,000 different aftermarket products, which are divided into three product lines. The core product line of the aftermarket division forms the company's basis and foundation. The company has been producing these products since it was first established and it is an acknowledged leader in the market of the products forming this line. Further, the products in this line contribute the greatest proportion to the company's total revenues. Also, the company earns the highest margins on this line of products. The second line of products is not as profitable as the core line, but nevertheless the company performs quite well in those product categories, earning reasonable margins on them. The third product line, which is also the newest, consists of products which the company purchases from a competitor, and then resells them under its own label. It has not been as successful as the other two product lines, lagging in sales and margins.

These 8,000 products are sold directly to original equipment manufacturers (OEM) or to distributors who resell them to the end-users. In total, the company has about 1,400 customers, which the company divides into three groups. The largest 25 customers are those with the largest accounts (usually worth millions of dollars each). These customers often buy from the firm as many as 3,000 different parts and components. A second group includes about 250 customers, also with large accounts (typically, hundreds of thousands of dollars each). The remaining group contains about 1,100 smaller customers.

Most of the data gathering was done at the firm's corporate headquarters located in an US Midwestern city. However, we also visited a representative sample of the firm's various customers across the US. The distributors we visited varied in how successful they were and in how large or small they were. The customers also included one of the OEM manufacturers. From those customers we obtained a broad range of details on the price adjustment processes and the customer implications of that process. In total our research team spent over 700 man-hours in the field.

The company management gave us a free access to all members of the organization that have a direct or indirect role in price setting and price adjustment decisions, both within the company as well as at its customer companies. We also

received access to company records that were relevant for price setting and price adjustment decisions.

Our goal was to study the details of all aspects of the price change process, a process about which we, the academics, know very little. Because the standard data sources and methods are of little use here, we designed and implemented an ethnographic data collection methodology. Our approach looks in depth at the price adjustment process of a firm with the goal of understanding what that process looks like from the point of view of the firm members that are involved in the process. The ultimate goal of this research program is to use the ethnographic data we gathered to gain insights relevant for theories of price adjustment.

We collected three types of data. The first dataset we collected by conducting open-ended interviews with 27 different organization members that were directly responsible for making the pricing and price change decisions and implementing them. At headquarters, these included the pricing directors and the members of the pricing team, the members of the marketing team, the members of the sales force, including the area managers and the field sales representatives, and the computer and information technology staff members that maintain various accounting and financial data bases of the company and provide computing services to various teams. We also interviewed the vice president responsible for the aftermarket products and the firm's chief financial officer. As well, we interviewed several former employees of the company. These individuals were instrumental in past price adjustment decisions and carried considerable institutional memory. Finally, we interviewed various representative customers at their sites.

The interviews were conducted following the standard inductive ethnographic interview methodology as discussed by Spradley (1979). All interviews except one were tape-recorded and transcribed. The interviews were between 45 minutes to 7 hours long, each. Several interviewees were interviewed more than once: five of them were interviewed twice, while two others were interviewed three times. The main pricing coordinator was interviewed almost every time we visited the company headquarters. In total, the transcription of the tape-recorded interviews produced over 500 pages of single-spaced interview transcripts.

In these interviews, our goal was to get a detailed description of the price setting and price adjustment processes from the point of view of those participating in these

processes. As such, the interviews were discovery-oriented: we sought to obtain native concepts and language. This inductive approach is a powerful methodology in settings where the goal is to see the process as the participants experience it. The inductive research methodology we followed is in sharp contrast with a more commonly used interview methodology which is aimed more at hypothesis testing, where the researchers solicit information from the interviewees in order to test the validity of their own prior theories and models.[3] Our method is especially useful for gaining insight on phenomena about which not much is known. This benefit, however, comes at a cost: the method is more complex and challenging for use and implementation. In addition, it requires that the researchers identify thematic patterns and recurring views and observations in order to make sense of the ethnographic interview data.[4]

We collected the second dataset by attending various pricing team meetings and making non-participant observations. Following the standard ethnographic procedures, two (or more) members of our research team attended numerous pricing meetings where a variety of pricing and price adjustment decisions, were formulated, assessed, analyzed, discussed, and debated. For example, we observed the process of formulating the list prices, we sat in on meetings where special pricing arrangements, such as international pricing or company's discount policies, were discussed and deliberated. We observed the interactions between pricing team members amongst themselves as well as with the members of other teams such as the sales team, marketing team, and financial analysis team. While many of these observations were made during formal (or semi-formal) settings such as at various functional group meetings, we have also observed their informal interactions, such as conversations in hallways and corridors, impromptu office visitations and interruptions, phone call inquiries, etc.

We created the third dataset using the internal company documents used during the pricing process. These include a variety of documents and analyses prepared by the members of the pricing team and by other groups' members during the annual price adjustment process. For example, these documents include documents defining the proposed pricing direction for the next year, documents used by the finance group

---

[3] See, for example, Blinder, et al. (1998) as well as numerous studies that followed it, which apply Blinder's method to a wide variety of firms and countries. See, for example, Fabiani, et al. (2004) and the studies cited therein.
[4] Under the hypothesis testing approach, in contrast, the data lends itself naturally to more traditional (and often even statistical) analysis. See, Zbaracki, et al. (2004, Appendix, pp. 532−533), for more details about the ethnographic interview methodology which we use here. See also Bewley and Brainard (1993) and Bewley (1999 and 2002).

representatives for the analysis of the competitive pricing situation, minutes from pricing meetings, email exchanges between various team members, organizational charts, process flow charts, discount request forms, published price lists, and numerous other documents generated during the price adjustment process.

In addition to these datasets which we have created, we also conducted numerous industrial engineering time and motion measurements (Karger and Bayha, 1977; Levy, et al., 1997, 1998; Dutta, et al., 1999). The methods were designed to address the specific task of estimating the time spent by "knowledge workers" on various price adjustment activities. These estimates were used to assess the amount of resources the company employed in various pricing and price change processes and activities.[5]

Based on the raw material contained in the three data sets, along with the time and motion measurements, we developed a detailed account of the steps involved in pricing and price adjustment processes as well as a detailed list of the individuals involved in these steps and their positions in that process. We also constructed a detailed account of the processes and activities required of these individuals for setting and adjusting prices. In this paper we focus on one event, a single price cut episode, which we believe vividly illustrates the true nature of the process of price adjustment and the complex and intense organizational activities that take place during that process.

3. The Anatomy of a Price Cut

Below we go through the anatomy of a major price cut which we observed over the course of our study. We begin by describing the economic forces that necessitated the price cut. We then turn to how the organization implemented that price cut, paying particular attention to the views that the marketing and the sales group member held about the price cut and about the necessary steps.

3.1. Economic Forces Driving the Price Cut

The decision by the firm to cut prices on one of their three product lines was driven by a variety of economic forces that were clear to everyone in the organization: variable costs had been reduced, customers were seen to be price sensitive, there was limited product differentiation, and prices were seen to be too much off market—

[5] Indeed, while our methods follow exactly the methods employed by industrial engineers, our raw data in the transcribed interviews provide recorded detail generally not available to them.

specifically, too high relative to the competition. The lower variable costs were the result of building two new product manufacturing facilities, an automated production line near the company headquarters and a production line in Mexico for which labor costs were substantially lower. With these two new facilities, the variable cost of production for one of the firm's three major product lines had decreased by 30 percent. As the director of pricing said, with the new production facilities, "We have had the chance to redesign the product line so that if we have to get down and dirty with the product line we can." The new production facilities were part of a major initiative of the organization and the logic behind it was common knowledge throughout the firm. The effect on variable costs was evident in the comments made by the members of both the sales force and the marketing group, as well as from the pricing documents we obtained.

There was also general agreement that customers were price sensitive, and especially so for the product line for which the firm had developed new production facilities. The director of pricing said this quite directly: "It is a highly price sensitive market. No question in my mind about that." The sales force agreed, though they spoke less directly about price sensitivity. Instead, they spoke frequently about the risk of losing a bid if prices increased, or the need to reduce prices to secure a bid.

Firm members consistently agreed that the products produced as part of this new line were not as differentiated from competitors' offerings in comparison to the other two product lines. As the pricing manager related, "I spend an awful lot of time managing the testing of competitive products and slowly and very surely there is no obvious differential between the products." The sales force agreed. One sales representative said that they used to be able to sell on the firm's name, but given the diminished differentiation, "The name don't [sic] mean as much." This was especially true of the newest product line. One part of this logic was technological. The product line was a late addition to their offerings, and production had been outsourced to other suppliers. Another part of this logic was that their brand was not as well known in this product space, and therefore their brand did not hold the same value it did in their core product lines. On the core product line the firm was the acknowledged market leader, and that product line sold in the greatest volume and for the highest margins. On the second line, the firm was less competitive, but still produced reasonable margins. But because the firm had been purchasing products for the third line from a competitor and reselling them under its own label, there was clearly little differentiation on that line.

This also led to the perceptions that this product line was overpriced in the marketplace, requiring that the firm reduce price. The director of pricing said that "the people who did know about us considered us one thing: high price." The sales force saw this as well. For example, one of their distributors said, "I could go in and quote a customer on [the core product line] and knock the doors off them but when it came to the [newest line] I couldn't come close." The new production facilities were intended to resolve this problem.

Given that this was a market correction in their price, the firm members felt that competitors would not react aggressively to this price cut. The vice-president responsible for the new production facilities said of their pricing actions, "My logic was they know that I am investing in [new production facilities] and they know they can't come at me there because now I have got them covered. … Now I am not losing money on [that product line] and they know that."

The direction of the price action was clear. (See Table 1 for a summary of the evidence.) With the lower variable costs, everyone in the organization agreed that the firm should reduce prices on that product line. They also all agreed on the economic logic supporting a price cut. But by how much and how were still to be decided.

3.2. Implementing the Price Cut

For deciding how, how much, and to whom the prices should be cut, the vice-president for aftermarket created a pricing team, which, in his words included "both field [sales] and inside [marketing] people." He presented them with the task of determining what to do with the prices on the newest product line: "When I gave the initial presentation, I laid out a number of different scenarios that they could look at and various ways of how things might look at the end of the day, but I had no ownership. I put them out so they could understand the range of things that they could look at." He was hoping to "build consensus on both sides." The group began with a clear understanding that prices should be cut and general agreement on the economic forces that were driving the price cut. Their task was to implement it. Thus, on the surface, this price cut appears quite straightforward and an unlikely source of substantial costs of price adjustment.

Yet it turned out to be a remarkably contentious and costly process. Members of the marketing group proposed lowering list price by nearly a third. The director of pricing described their reasoning, saying, "I believe the velocity [high volume] parts are driving

the market and I need to present to my end users that we have really great value on these part numbers." Members of the sales force believed that while a price reduction was necessary, it could be implemented more effectively with appropriate discounts, because it was more likely to be passed on to the end user. A member of the sales force said, "Now we could have given that in the form of a discount or growth program. A lot of different ways to get the impact that you want." The contention created by these two positions was so great that the decision became, as one member at headquarters said, an "emotional issue"—so emotional that a pricing analyst describing the process said "there was one argument … that I thought they were going to throw punches."

To understand the differences between these groups, we next analyze the price cut from their perspective within the organization. In particular, we study the price cut decision from the perspective of the marketing and the sales groups, focusing not only on their economic reasoning but also on the language they use to make sense of that economics, on their perceptions of an appropriate action, and on their perceptions of the other group's perceptions of these actions, as grounded in the practice and the reality of each group. We turn to this next.

3.3. The Marketing Logic

The marketing group's logic was driven by an assessment that the price to the end customers was too high, and that the price cut needed to change this perception in the marketplace. This view was driven by their beliefs, their experience, their analysis of the company data (prices, volumes sold, growth and profitability) and of a large competitive database, and customer research undertaken by the marketing group. They were convinced that the end customer was price sensitive for products in this line. For example, the director of pricing had in mind the end-customers when he said that it was "a market that was price sensitive." They also believed that the end-customers did not see an added value and differentiation from the offerings on this product line. Their market research of the end-customers led the director of pricing to the conclusion that "There was no obvious real product differentiation." Similarly, the vice-president described market research that showed that "they were perceived [by end customers] to be high priced in the market." The director of pricing said that the competitors had already taken the lack of product differentiation into account by creating a production and pricing system that focused on the velocity parts in the market. He said, "Our competitors had

been set up to go screaming down their production line. When you went into almost every customer those were the parts they asked you what the price was." He was arguing that his competitors had developed production and pricing systems tailored to the high volume ("velocity") parts that customers cared about.

In response, the pricing director wanted to be able to price aggressively on those products. The marketing group believed that the firm's market position and the reputation for high prices reduced sales. A lower price would change this perception in the marketplace. It would signal to competitors that the firm was now serious about competing on that product line. Lower prices would position the firm as a value producer to the end user, which was central to the logic supporting the price cut at headquarters. As a financial analyst said, "Our belief was that if we wanted to drive volume we needed to get a price reduction to the market." The goal was to get a lower price to end customers in the market, and make sure the marketplace was aware of this.

The question was how best to do this. The director of pricing said that they believed that aggressively reducing *list* prices and "promoting the hell out of it" were the best way to accomplish this. That is because in their opinion, the list prices were the most visible prices in the marketplace. These were the only published prices, and all distributors received books and CD's with these prices in them. Their own data base of competitive prices was created from the list prices of competitors gathered from the marketplace. Moreover, distributors often showed their list prices to end customers to justify the prices they charged. Discounts, rebates and other pricing terms varied by customer, and were too hidden—and thus not as easily visible, to end customers in the marketplace.

List prices were also most visible to the firm's competitors. Moreover, since they were distributed to all distributors, a list price cut would be easiest for competitors to interpret, making a list price cut a more effective signaling tool. Discounts, rebates and other pricing terms were customer specific and too fragmented to serve as a useful communication and signaling tool to competitors in the marketplace.

The marketing group considered distributors for this price cut, but they viewed the distributors as a constraint on their drive to present a clear signal to the marketplace. They were worried that distributors would not pass-through the price reduction, pocketing the price cut without having the intended effect on the end customers and on overall marketplace that they so stridently longed for. They believed that the visibility of

the list prices meant that the reduced prices were more likely to be passed through from distributors to end customers. Further, they reasoned that end customers would be more likely to know about the list price decrease, creating customer pressure on distributors to pass through the price cut or risk unfavorable image in their customers' eyes if they pocketed the reduction. Also, other distributors would be more aware of this given the list price reduction visibility. Distributors knew that list prices were the same across all distributors, but discounts, rebates and other terms could vary. A list price cut would be seen equally clearly by all distributors, thereby adding further pressure to pass on this price reduction. Discounts, rebates and other pricing terms varied by distributors, which could make the signal the firm wanted to convey to the marketplace, unclear.

At the company headquarters, the list prices also had an additional meaning, beyond its intended role as a vehicle to carry the price cut, and as a signal to customers and competitors. For example, list prices were used at corporate headquarters for strategic planning and for evaluating revenue, profitability and growth goals. These analyses and evalutaions aggregated price information across all products. Given their assumptions about the price sensitivity of the end customers, for the marketing group it meant that higher volumes for the entire market would make up for the lower price, and hence they could expect both revenues and profits to go up. The marketing group did frequent analyses to see if the list price cut could be profitable and meet company goals. Nevertheless, the consequences of the price change for the volume sold, for revenues, and for the profits were perhaps the greatest source of uncertainty of the marketing plan. Even the pricing manager who was one of the strongest advocates of lowering the list prices had such doubts: "I am afraid right now and concerned about our ability to gain the volume back in the first year, quite honestly."

Finally, the headquarters staff distrusted rebates because they viewed the sales force as being incapable of cutting the end customers' prices effectively. One reason was that discounts, rebates and other pricing terms were specific to individual customers, and too fragmented to serve as a useful communication and signaling tool in this marketplace. Discounts and rebates would not accomplish the task of repositioning the product line and clearly communicating that repositioning to end customers and the competitors. The director of pricing was also concerned about the costs of using discounts, rebates and other negotiated pricing terms. This was a common view at headquarters. The pricing director was worried that rebates "easily get out of hand. They are driven by not making

decisions up here." Similarly, the CFO thought that rebates "are a warning that somebody is not selling now very well." And the vice president suspected that the sales force did not want to lower list prices because instead "the field sales people wanted to give their customers a better discount and go in as heroes." This perception at headquarters led the pricing director to describe the sales director and the sales manager, who both opposed his proposed list price reductions, as "champions of high price."

In sum, in their proposal to cut list prices, the marketing group focused on getting the end-customers prices down, and sending a clear signal to the marketplace that it was going to be more competitive on this product line. They felt that aggressive list price reductions, actively communicated, were the most effective tool to accomplish this goal, and were therefore the best way to reduce the prices in the marketplace. The logic of the marketing group rested on their assessment of end customers, of the effect of the visible list price cuts on the marketplace, on the value of list price cuts as a signal to competitors, on the ability of list price cuts to lead to faster and more complete pass-through of these prices reductions to end consumers, on the use of list prices in the company's profitability analysis, on their concerns about the costs of managing and administering discounts, and on their belief in limitations of discounts for accomplishing the company's goals. (See Table 2 for a summary). This logic was consistent with the marketing group's role in the standard operating procedures for price adjustment at this firm. In fact, this focus on the end customer, list prices, aggregate consumer data and behavior, limited study of distributors and a variation/segmentation among distributors, and lack of attention to discounts was true of most of the price adjustment decisions made at this firm. (For more details, see Zbaracki, 2005 and Zbaracki, et al., 2005.)

3.4. The Sales Force Logic

The sales group's logic was driven by their beliefs, their experience, and their analysis of specific customer bids. They thought that the price to distributors was too high. They also saw that the severity of this problem varied substantially across distributors. To be effective, they felt that the price cut needed to address channel of distribution and segmentation issues.

The sales group was the direct interface with the distributors, which meant that they had to understand the distributors' concerns. In fact, the sales force viewed the distributor as *the central* customer, and therefore, they had trouble with the marketing

group's view of the end customer as being the focal point of the price cut decision. One sales representative described: “I had trouble myself understanding, if the end user is the customer how could you not call on the customer. And if the distributor is not the customer then why are we calling on them?”

The sales force sought to get lower prices to the distributors in the most effective way. Distributors purchased the products directly from the firm and thus served as its middleman to the end customers. Therefore, to generate end customers sales, the members of the sales force had to generate sales and support with the distributors. The sales force sought to target rebates to such situations. The sales director explained, saying “The rebating is a tool and helps … The reason we can give special pricing is to meet competitive pressures. And if there is an increase in our volume, we are not increasing our fixed costs so therefore we are looking at incremental profit and we can get more competitive and do this with you.”

In evaluating distributors, members of the sales people assumed that distributors were not list price sensitive. In the words of a sales manager, “In our industry the list price doesn’t mean anything to anybody.” In their experience, and from their point of view, the customers—that is, the distributors, were sensitive to changes in discounts because price was determined in negotiations with distributors about the net acquisition price of the products they purchased. The language of price sensitivity was used less directly, but this logic was clearly part of their thinking. A sales representative explained how customers reacted to prices: “I have one [major customer] that buys about one hundred thousand a month by themselves and you can’t change their price. If I had changed one [part number] in that place [our major competitor] would have been there in a heartbeat. …If we don’t advance it or adjust to it then somebody will.”

The sales force was also more attuned to differences between customers in the marketplace. They assessed the market situation at the level of individual bids, rather than at the level of the marketplace as a whole. For example, they recognized that lower costs for the product line had different implications for different customers. Some distributors purchased very few products from this product line. For those customers, despite the desire to create a value perception, the lower prices would have little effect if at all. Other customers bought large volumes of that product line, however, and therefore for them the price cut would be essential. Similarly, the sales force encountered the competition on a deal-by-deal basis. As one sales manager explained, “We have to go in and say, ‘What

are your top numbers? OK, what drives your business?'" Given those factors, the sales representative could position their bids by individually tailoring them against competing bids and arrive at a discount off of list price for the set of products the distributor sold. But because different distributors sold different combinations of products, the sales force found that price sensitivity varied across customers and bids. Consequently, they believed that the revenue, profitability, and growth potential also varied by bid.

Given this segmented view, reducing list price to all customers made little sense to the sales force. List price reductions, because they are given to all distributors, don't address these segmentation issues. As the sales director said, "when you change it with it up front [list price] then you're limiting yourself – you're right off the bat giving away some profitability and hoping you get the return with increase in margins or volumes." As a result, one sales person stated, with a list price cut, "80 percent of our business we lowered for no reason at all."

The sales force felt it could use discounts to take the variations in market conditions into account when adjusting prices. For example, the VP stated that we "provide a discount structure that tries to deal with the market structure," and the director of sales stated that discounts are "necessary in dealing with exceptions." While a list price might be a useful starting point, the task of the sales force was to provide a discount structure that took into account the varying customer circumstances. Discounts were useful when the firm needed a particularly competitive price, but otherwise prices could be left higher.

The sales representatives felt that distributor pass-through would also be more effective with appropriate discounts. For example, a member of the sales force said of a list price reduction, "If I am a distributor and I am already selling to this guy and [you] lower my [list price] do you think I am going to pass that along to this guy? I don't think so. I am going to put that in my pocket. So what did it gain us? It cost our company money. ... Now we could have given that in the form of a discount or growth program. A lot of different ways to get the impact that you want; it didn't make any sense at all."

They sales people also evaluated the revenue, the profitability and the growth implications at the bid level, and therefore the list price only mattered as the base for the distributor's acquisition price. The final price, net of discounts, was what they used to evaluate their bids, and their revenue, profitability and growth implications. The bids evaluation by sales managers at company headquarters was done in a similar way.

The sales force doubted that the marketing group could adjust list prices effectively, because in their opinion marketing was too far removed from customers. One member of the sales force described the marketing group home as "mahogany row." The director of sales said that "the sales people did feel they were closer to the market and understood the market much better than the marketing people." He questioned the value of the marketing group, saying "Anyway, what you have in my opinion was very minimal experience with this industry [in marketing] up against people with a lot of experience in this industry."

In sum, the sales group felt that the company's goals and interests would be best served if they focused on getting distributor prices down and dealing with differences across segments of distributors. They felt that a selective use of discounts were the most effective tool to accomplish this goal, and therefore the best way to reduce prices in this marketplace. Their logic rested on their assessment of distributors, their knowledge of differences between distributors (in price sensitivity, product mix purchased, competition and other market factors), the ability of discounts to enable faster and more complete pass-through of the prices reductions to end consumers, their use of acquisition (rather than just list) prices in analysis, and their concerns with the capabilities of the marketing group to use list prices for accomplishing the main goal. (For a summary of these arguments, see Table 3.) This logic was consistent with the sales group's role in the standard operating procedures for price adjustment at this firm. In fact, this focus on the distributors, discounts, and segmentation, along with their limited exploration of end customer prices and perceptions, broad market positioning and signaling, and analysis of the overall profitability across product lines was true of most of the price adjustment decisions made at this firm (see Zbaracki, 2005; Zbaracki, et al., 2005).

3.5. Denouement

The task force recommended a list price reduction, due in large part to the fact that the composition of the pricing team included more marketing people than sales people. But the dispute generated what the vice-president of marketing described as one of the "biggest knock down, drag out" battles. The task force handed a recommendation to the VP of marketing who had originally set up the team, but with strong dissenting opinions from the sales force. The VP accepted this decision grudgingly, stating that "a recommendation to lower list price was probably not what I would have gone with."

Nevertheless, he accepted the recommendation, despite pressure from the sales force within the firm not to do so.[6] The salespeople, when commenting on the decision, said frequently, "I think it was a mistake." But the director of sales said, "You've got to move on. You can't keep fighting it. It is pointless. You have to move on and make it work." In the end, list prices were reduced by about a 25 percent.

4. Discussion

Recall that at the outset, we argued that the firm members all agreed with the general economic logic that clearly indicated that the firm should cut its prices. Nevertheless, they disagreed about how the firm should cut prices. That led to the conflict that we have just described. Having presented the price cut episode in depth, we now turn to discussing the lessons we believe it offers. We classify these lessons into four categories.

4.1. Organizational Layers of Complexity and the Costs of Price Adjustment

"I didn't realize. So all that was going on and we never noticed." (Emily, *In Our Town*, by Thornton Wilder)

As the price cut episode reveals, the price cut for the new product line was indeed implemented as dictated by the underlying economic forces (the competition, the costs of production, etc.). The analysis, however, also reveals that behind this price adjustment lie a remarkably rich tapestry of organizational frictions, which offer insights into the organizational sources of the costs of price adjustment. Many of these frictions, it seems, are a result of the inherent complexity of the specific questions the organizational members need to answer in order to reach a decision. Thus, although all members of the organization agreed on the need to cut the prices of the new product line, it turns out that the specific aspects of the price cut, such as the magnitude of the price cut or the identity of the customer groups to which these price cuts would apply, etc., are far more complex.

Recall that the decision to cut prices on the new product line was motivated by four economic considerations (see table 1). First, there was a decrease in the variable cost of production. Second, the consumers were becoming more price sensitive. Third, the consumers were seeing less and less differentiation between these products and the

---

[6] For more information on the vice-president's decisions, and other more sociological dimensions of this price adjustment decision, see Zbaracki, 2005.

competitors' products. Fourth, the products seemed to be overpriced in comparison to the competitors' products. All organizational members that were engaged in forming and in finalizing the price adjustment decision in this specific episode, including the members of the marketing group, the members of the sales group, as well as the vice president in charge, agreed with these four observations.

It turns out, however, that when it comes to identifying the specific details of the four economic factors, the organizational members are forced to address a variety of additional questions. On some of these they disagreed sharply, which led to diverging views on the necessary pricing actions in response to the seemingly obvious and clear market developments.

Consider first the questions of price sensitivity. Although everyone agreed that customers were price-sensitive, there were additional questions about who these customers were or to which prices they were sensitive to. That is because the firm serves a variety of customers through its supply chain—from end customers, to distributors, all the way to original equipment manufacturers. For example, they disagreed on which customers the company should focus on as it revises its prices: the distributors or the end customers. They disagreed on whose price sensitivity was really crucial for the company's success: the price sensitivity of the distributors or of the end customers. And they disagreed on who is more price sensitive: the distributor or the end customer.

Similarly, the company's prices consist of a variety of price concepts and lists, including list prices, the prices net of quantity discounts, prices after rebates, individually negotiated prices, etc. Consequently, the different organization group members disagreed on the specific steps that need to be taken in light of the economic developments. The group members disagreed also on which prices should be reduced. Should they reduce the list prices, or the discounted prices? The marketing group believed that the list prices were the key as they were the most visible to the market participants. The sales people, in contrast, thought that reducing the prices to individual distributors by selective use of discounts was the key to successful adjustment of the company's pricing to market conditions.

These disagreements were not limited to the issues of prices and price sensitivity. The pricing team members also disagreed on which product prices should be reduced. Should they reduce the price on a few high revenue products, or should they reduce the prices across the board on all the products included in the product line? Should they

reduce the prices of the products for distributors according to the quantity the distributor is buying, or should they try to reduce prices for end-customers? Or perhaps they should consider the competitors prices and reduce the prices of only those products whose relative prices seem to be out of line with these market prices?

These disagreements point toward the inherent complexity of price adjustment decisions in multi-product business-to-business transaction settings. They suggest that what may appear as a fairly trivial component of price adjustment decisions, such as price, quantity, consumer, and market, are far from trivial. The organization members disagreed on the interpretation of each one of these components depending on their own realities within the organization. They disagreed on which prices should be cut; they disagreed on who the target consumers were; and they disagreed on the interpretation of the consumers' price sensitivity.

Though they disagreed on the interpretation, we found that the arguments made during the pricing group meetings and debates were frequently about economic issues and were indeed cast as such by the group members. For example, the arguments about which prices to cut, on which products, to which customers, etc., all were cast in economic terms. On numerous occasions, however, these arguments appeared to reflect far deeper tensions and conflicts. These included questions of mutual respect, questions of power, questions of influence on the company's higher management, and other related issues that are an integral part of any large multi-layered organizational entity.

We find that these inherent conflicts and tensions, and the resulting disagreements among the members of the organization, consumed substantial amount of resources, both physical and psychological/emotional, in terms of the group members' and the managements' time, attention, and activities. They therefore are the direct source of the frictions and barriers to flexible price adjustments within the organization and thus, the direct source of organizational costs of price adjustment.

4.2. The Cost of Working with Colliding Partial Models

"I somehow find that you and I collide." (*Collide*, by Howie Day)

The anatomy of the price cut also suggests that in large organizations of the type we study, each group within the organization operates using a fairly *coherent mode*l of "optimal" price setting. Group members rely on these models to decide on what kinds of

recommendations to make about the necessary price adjustment actions. These models usually take the form of an intuitive structural image of the web of the economic and non-economic forces, the hierarchies, and the relationships in which the group members operate. The models are constructed and formed by the group members based on their roles and positions as well as on their routine day-to-day activities in the organization. The models shape their experience and consequently their point of view. These models, therefore, reflect the problems, the issues, and the questions that the group members face in their daily routines and activities. Consequently, these models are only *partial* in the sense that they do not fully capture, and therefore they do not fully reflect the goals, the problems, the issues, and the questions facing the members of the other groups.

For example, at the organization we studied, the marketing and the sales group almost always took vastly different—and quite often, opposing—stands regarding the pricing actions necessary to respond to changes in market conditions. Our analysis of the ethnographic interviews and the information we obtained based on our non-participant observations, however, suggests that these kinds of disagreements do not always lead to conflicts and disputes. Whether conflicts and disputes follow or not depends on the magnitude of the changes in the market conditions, as well as on the consistency of the models used across the groups. For example, if the models of the marketing and the sales group were relatively consistent with each other in the sense that they did not prescribe completely opposing actions, then the price adjustment decisions were formulated and implemented rather quickly and with little dispute. Similarly, if the changes in the market forces were small, then the necessary response was also small, and therefore, various group members could formulate their recommendations with relatively little effort.

When the changes dictated by market conditions were large, however, then we observed that the resulting disagreements placed the *partial models* used by different groups of the organization in a direct conflict with each other, leading to considerable adjustment costs in terms of the time and the resources the organization had to incur. This was the specific price cut episode we studies. Consider, for example, the marketing group's mode of behavior—that is, the marketing group's model. Their logic for a need to lower the list prices was sensible given their position within the organization, the data they had, their experience, the customers they faced on a daily basis, and given the issues, questions, requests, and complaints, they had to deal with routinely on an on-going basis. Their job description required them to focus on the end-customers, who, they believed,

were very price sensitive, and thus expecting lower prices given the market conditions at the time. They also believed that changes in the list prices were more likely to be passed on to end-customers. In their world view, the overall profitability of the company was assessed using the list prices. Further, they truly believed that individual discounts were too costly to manage.

Thus, after considering the data on the overall competition and sales, and armed with data and information from the end customers, it was clear to the marketing group that the end customer prices for the new product line needed to be lowered. Moreover, because the marketing group's goal was to signal to the entire market a change in the pricing of the entire line of products, they wanted to make the recommended price cut as visible as possible not only to the end-customers, but also to the distributors as well as to competitors. Their recommendation to reduce the list prices, therefore, was clearly sensible, logical, and defendable within the framework of their operating model.

Now consider the model of the sales group. Their job required that they focus on distributors, and therefore quite naturally believed that the distributors should receive the price cuts. In their opinion, market segmentation based on a variation in the competition and in the price sensitivity across the distributors was an essential component of the "right" pricing model. They did not believe that the end-customers were sensitive to the list prices. Instead, they thought, discounts should be used because discounts were a more effective pricing tool. In short, they believed that marketing group's model was completely (or almost completely) wrong. Given the work done by the members of the sales group, and given their daily experience, and the issues, the questions, the problems, and the challenges they faced on an ongoing basis, this stand was logical, sensible, and was easily defendable. The sales group's recommendation, therefore, was also justified given the image, the structure, and the focus of the model which governed their routine work, behavior, and experience at the organization.

Consider, however, the consequence of these conflicting points of views of the marketing and sales team members. They each had a point of view which was shaped by the realities, the experiences, and the situational structures in which they operate on a daily basis. Everyone involved in the discussions during this price cut episode agreed that the price cuts necessary in response to the developing market conditions was substantial and major. However, the points of views of the two teams—and consequently their recommendations—were contradictory and inconsistent with each other. As a result,

given that the stakes and the disagreements involved were so large and so important, no team was willing to give in or compromise. They were very firm in their insistence on what the right action was in their opinion.

Moreover, the disagreements were so sharp and the participants were so resolute because of the size of the price cuts needed, that the episode brought up to the surface far deeper issues lying underneath the partial models that the two group members were following to make their price change recommendations. These issues include very fundamental questions such as, “Who is the customer?” “What constitutes a price?” as well as questions of more technical nature such as, “How price-sensitive are the distributors?” “How price-sensitive are the end-customers?” “Who is more price-sensitive?” “Which price adjustment is more effective?”

Even more disturbing (and sometimes even offending) for each group members was the fact that the other group members appeared completely blind to their concerns and realities. For example, the marketing group members thought that discounts were getting out of control and that managing the discounts program was too costly. Moreover, they found it hard to understand how the sales group people could not see the importance of the list prices. Similarly, the sales group members thought that the marketing people were completely out of touch with the customers. They had difficulty understanding how the marketing group people could not see the central importance of the distributors. Each team thought that they had the right model, and the other team’s model was fatally flawed.

The picture one gets from observing this remarkable price adjustment episode is that each group has a working model, but these models are incomplete and partial. They are incomplete because they do not consider all variables involved, and they are partial because they only address the concerns and the issues from the point of view of the specific group, almost completely ignoring the concerns and the issues of the other group. Perhaps more importantly, among the missing variables of each group’s model, are key variables of the other group’s model. For example, the marketing group’s model clearly ignores the issue of segmentation of the market across distributors, which the sales people consider so critical. Similarly, the sales group completely minimized the importance of the list prices for the end users, which the marketing people thought was the key factor in an effective price cut.

Moreover, because of the complexity of the process, certain factors seem to have been ignored by *both* groups all together. For instances, neither team could make the extraordinary effort necessary for determining the extent of the price sensitivity (that is the elasticity) of “their constituencies” via statistical methods and analysis. Also, because the pricing structure followed internal and external routines, we found that neither team could consider or implement new forms of pricing as a way to resolve the problems they thought the company was facing. For example, we did not find a single person that knew the prices of all the products to all major customers.

Thus, the image of partial models crashing into each other, the loss of time and organizational resources, and the emotional and social wounds that can be wrought from such exchange—all came to the surface during this price cut. This suggests an image of firms in truce over their disagreements on the big economic issues they don’t really have the answer to with their current data, knowledge, systems and structures. Decisions that require firms to revisit, possibly break, and then be forced to remake existing truces are the ones that bear the biggest costs of price adjustment. Decisions (e.g., a small price change) that allow the truces to remain and the points of contention to remain unaddressed, will not bear these substantial costs of adjustment. In the specific episode we study, the price cut was substantial enough to bring into conflict these deeper issues lying underneath the partial models across the managing teams of the company. Thus, these “points of contention,” which are the source of conflicts between the various organization units and their members, are the second—and perhaps a larger—component of the costs of price adjustment facing an organization.

4.3. Cost of Uncertainty

> “First, firms often told us—in a variety of contexts—that they are loath to change prices because this would ‘antagonize’ their customers. This imprecise thought does not fit neatly into any economists’ standard theoretical boxes, although it may be consistent with several. But it comes up so often that figuring out precisely what it means should be a high priority item on any future research agenda.”
>
> Blinder, at al (1998, p. 313−314)

Our observations at the price setting and price adjustment group meetings and a careful analysis of the transcripts of the ethnographic interviews we have conducted at the organization, point towards a broader issue that many of the individual participants seemed to be grappling with as they were formulating their views about the necessary

actions the company had to undertake in response to developments in the marketplace. That issue is uncertainty. The uncertainty was not about whether to reduce prices; firm members agreed prices should be reduced. In regard to the question of how to reduce prices, however, both the arguments and the language used by various participants suggest that the inherent uncertainty of their environment is a deep source of friction.

The analysis of the language used by various participants, shows that this uncertainty is often expressed implicitly in very subtle ways. This uncertainty begins with the pricing team members' inherent inability to predict the outcomes of their decisions and recommendations. For example, they could not really predict how different distributors would respond to different degrees of price change. Nor could they predict the response of individual end-customers, such as the response of the original equipment manufacturers, to various forms of price adjustment decisions. This Knight-ian (1921) form of uncertainty, that is the inability to express in probability or in likelihood terms the uncertainty they faced regarding the response of the firm's consumers and competitors to the firm's price adjustment decisions, seemed to play a critical role in the way various pricing group members formed and expressed their opinions.

These uncertainties were not limited to consumer related issues, however. The participants also seemed to be unsure of the way various competitors would respond to the firm's decision to adjust its prices. They had no way of predicting how various competitors would respond if the firm made its price adjustments by adjusting the discounts, as recommended by the members of the sales group, or, more visibly, by adjusting the list prices, as recommended by the members of the marketing group.

The pricing team members were also uncertain about the response of various organizational members to their suggestions and proposals. These uncertainties reflected the organizational and structural limitations under which the various group members were operating. For example, the fact that the marketing (sales) team members typically ignored many of the issues and aspects of price adjustment that the sales (marketing) group members would care about—meant that they would not always be able to anticipate their reactions. The *internal uncertainty*—that is the inability of the various organization members to correctly anticipate other member's responses and actions, however, was directly linked to the *external uncertainty*—that is their inability to anticipate the response of the outsiders, which include the end-consumers, the distributors, and the competitors. Moreover, as the evidence shows, this uncertainty

threatened to unravel the agreements over the meaning of even such basic constructs as "price" and the "customer," as well as the roles of the various participants in the pricing process.

The firm's inability to anticipate the reaction of its consumers and competitors to its price adjustment decisions, make any price adjustment a risky decision (as hypothesized by Stiglitz, 1984). It should not be surprising, therefore, to find that the pricing managers sampled by Blinder, et al. (1998) were "… loath to change prices… because this would antagonize their customers." The potential effects of that customer antagonism had repercussions that resonated throughout the organization, leading to a fundamental uncertainty about what to do. This uncertainty, and the resulting anxiety and trepidation, along with the fear of alienation of consumers, imposes on the organization an additional layer of price adjustment costs that goes beyond the time and resource costs, as discussed above. This component of price adjustment costs primarily captures the emotional and psychic costs of price adjustment, in line with the sentiment expressed by the pricing managers that Blinder, et al, (1998) have interviewed.

Possible responses to this kind of deep, fundamental organizational uncertainties would be to try to get more data and information, and perform some analyses. One approach would have been to apply a bit of analytic work. For example, the disputes whether the customers were sensitive to changes in list prices or discounts could be resolved with some basic statistical and econometric methods to measure sensitivity and a bit of market data. Similarly, disagreements on the importance of list price to end users could be resolved by using techniques that are designed to measure customer values and perceptions such as customer interviews and surveys. And uses of discounts could be (and often were) supported by calculative tools that analyzed the effects on profitability of a discount. But each of these methods created further difficulties. Primarily, at the time of the disputes, there was no such data to use for analysis. Resolving the dispute with analysis required resources to be allocated to the task of gathering and analyzing data. And advocating such analysis risked extending the dispute from the right action to the right way to analyze what would be the right action. Indeed, this company was in the process of investing in a variety of training, hardware, software, data gathering and analysis tools.

Another approach to dealing with this fundamental uncertainty is to appeal to organizational solutions, such as hierarchy (which they use in this case, appealing to the

VP of marketing). At this level, the problem might be considered a problem of influence and incentives (Rotemberg and Saloner, 1995; Milgrom and Roberts, 1992), in which different groups lobbied for the value of their own approach to a problem. Clearly these could be part of these organizational costs of price adjustment. But there were costs beyond these kinds of goal and incentive conflicts. There were deeper disputes over definitions of customer, price, and firm goals that were not easily resolved because the meanings were situated in the ongoing activities of each of the two groups. The major price cut forced them to revisit fundamental issues that were organizational points of contention. Fundamental decisions on who was the central customer, what prices they reacted to, the role of list price, and other considerations ran deep. The company did not have consensus on those issues and it is not clear they had the data, analyses or ability to answer those questions at the current time, even if they wanted to.

4.4. Convexity of the Costs of Price Adjustment and Organizational Rigidity

Our data confirms the view that in settings where price adjustment process has a substantial managerial and organization component, the price adjustment costs are convex, that is, they increase with the size of the price change. The data suggests that when the price changes necessitated by changes in market conditions were small, the firm did not have to devote too many resources—in terms of both organization members' time and effort—to the price adjustment decisions. That is because more organization members were willing to give in and compromise when it came to relatively small price changes, even if they disagreed with the initiative.

When it came to large changes, however, the company found it very costly to deal with them. The costs of the disputes, the debates, the arguments, and the disagreements that the organization was incurring under such conditions, were enormous. These disagreements and disputes manifested themselves not only in various functional group meetings but also in informal settings such as during lunch times, in chats and conversations in the corridors and the hallways, and even in the complaints and the frustrations the various organization members would frequently take home with them. As demonstrated above, these frustrations and complaints were frequently openly addressed in the ethnographic interviews we have conducted.

Facing these kinds of increasing costs, the organization has adopted various strategies designed to help it cope with the costs, as predicted by the behavioral theory of the firm (Cyert and March, 1963). For example, the company has in place price adjustment processes and routines. These provide an organizational framework and an organization structure for making price adjustment decisions. The hierarchical structure of the price adjustment decision making process enables the higher managerial decision makers to make the critical/hard decisions in circumstances where various teams and their members operating in the organizational layers underneath the higher layers are unable to reach an agreement through negotiations and compromise.

In addition, given the complexity of the price adjustment decisions the company faced on a regular basis, even when the changes necessitated by market conditions were relatively small, the company's pricing managers made a heavy use of various types of heuristic price setting and price adjustment rules of thumb. Such pricing rules were required given the sheer scope of the pricing task the company's pricing team faces on a regular basis: How to adjust the prices of 8,000 different products, when (i) for each product the company faces five or six different competitors, (ii) the company needs to assess the effect of the proposed price changes on 1,400 of its customers, when (iii) most of these customers are buying hundreds—and many of them, even thousands of different products, (iv) while having no tools for predicting the reactions of these customers, nor (v) the reactions of the competitors, given (vi) the uncertainties they face. Also, recall the organizational disputes and the conflicts ("partial models") the organization faced when the proposed price changes were large. These imposed additional aspects to the complexities of the price adjustment decisions, making the price adjustment decisions even more complex.

We find that at the organization we studied, these heuristics and rules of thumb took various forms (Galí and Gertler, 1999; Amato and Laubach, 2003). For instance, as mentioned above, in many price effect simulations where the pricing team members would try to assess the effect of a given proposed price change on a particular customer or on a particular product, the analysis was conducted and the expected effects were simulated without using the relevant elasticity estimates. Thus, for example, in some analyses they would estimate the effect of a price increase on a particular product by assuming that the quantity sold did not change (implicitly assuming that the price elasticity of demand was zero!). Such rules of thumb make sense only when considering

the above complexities, the uncertainties and the ambiguities of the internal processes involved in calculating the effects of a price change.

Other examples of heuristic price adjustment rules of thumb that we found at this company were rules such as “competitor A plus 2 percent,” or “competitor B minus 4 percent,” or “last year’s price minus 12 percent,” etc. The company’s pricing team members often applied these types of heuristic price adjustment rules for adjusting the prices of a particular product for a group of customers (e.g., the top 25 customers, or top 100 customers, etc.), or for a particular group of products—where the grouping was done based on the products functionality or based on the specific competitive market conditions for the particular products, etc.

The establishment of rules, routines, procedures, hierarchical structures, and other similar types of “institutions” within the organization, enabled the company management to make the complex process of the price adjustment decision-making manageable. These *organizational institutions* helped the company management make the price adjustment process more rigid and structured, and thus reduce the costs of the price adjustment. Thus, these organizational institutions helped the company in establishing and creating the truces which the organization was willing to tolerate in light of the inherent organizational disputes and conflicts.

Thus, our data indeed suggests that the price adjustment costs in this organization were convex. However, this convexity, it turns out, has a deeper and subtler dimension. It is not just the magnitude of the price change that matters. When the situation in the marketplace warranted a consideration of large price changes, the managers were forced not only to revisit the company’s prices, but to revisit the organizational truces themselves. Thus understanding these organizational truces and the processes that lead to their formation is an important factor for understanding the nature of the convexity of the price adjustment costs the price setters face in a large multi-product, multi-customer, and multi-competitor environments.

4.5. Lessons From, and For, the Behavioral Theory of the Firm

“We can find common ground only by moving to higher ground” - Jim Wallis, The Soul of Politics

Many of these lessons are consistent with work done on the behavioral theory of the firm. For example, the work on the behavioral theory of the firm carefully develops

the inherent complexity underlying decisions within organizations. Moreover, some of the central relational constructs of the behavioral theory of the firm (Cyert and March 1963, chapter 6.3) seem to describe aspects of what we observed during this price cut, in particular quasi resolution of conflict and uncertainty avoidance. Consider quasi-resolution of conflict. This captures the latent conflict that exists between managers and coalitions within the firm, and is a source of friction lying at the heart of the behavioral theory of the firm. Firm standard operating procedures and processes take this into account when they are developed, attempt to minimize wherever possible, and accept solutions that only "quasi" resolve it - allowing it to stay unresolved rather than to pay these costs of resolution. Thus, the idea of organizations as being in "truce" lies behind many discussions of the scholars studying the behavioral theory of the firm (e.g., Nelson and Winter, 1982). Although these conflicts are explored as political or sociological in nature, whereas ours are also economic in nature, the episode we study presents these costs of conflict, over unresolved points of contention, as a central organizational cost of price adjustment. Similarly uncertainty avoidance has been developed in the behavioral theory along lines of political or sociological uncertainty to be avoided. Here we expand the sources of uncertainty to include market forces that are difficult for firms to deal with, such as customer or competitor response. One could see frictions in price adjustments that require firms to deal with these areas of seep and fundamental market uncertainty.

This suggests recasting the work on the behavioral theory of the firm as sources of organizational costs of price adjustment may be a promising direction for economists to explore. There many lessons that can be drawn from the behavioral theory of the firm for economists in this area. It may offer a rich organizational language, examples, and structures in this area that may lie at the heart of organizational sources of the costs of price adjustment.

At the same time, the bulk of the work on the behavioral theory of the firm focuses only on organizational issues – placing the economic issues in file drawers and relegating them to backstage actors as the managers with their political, social and organizational interactions and dynamics play the central roles. So the concepts of complexity, uncertainty, latent conflict and truces are all developed at the level of social interactions in an economic vacuum.

Yet we find that economics actually lies at the heart of many of these uncertainties, conflicts, and truces – at least in the context of price adjustment. For

example, the behavioral theory of the firm addresses coalitions of managers with different goals, power and their political implications. Our results suggest that to understand these coalitions we must also understand how the economic models, data, and analyses are used. Likewise, latent conflict and quasi resolution of conflict may be related to the way economics is done. Partial models in conflict point towards many of the deep areas of uncertainty and latent conflict. Further, they underscore the need for learning about things beyond the firm: a market made up of customers and competitors whose motives and actions they can never know for certain and can only hope to understand vaguely.

Recasting the behavioral theory of the firm in terms of what variables the organization is uncertain of, what models can be used, how they may work in conflict with each other, etc, may be valuable for organizational behavior scholars to explore. Taken together, these results suggest a different relationship between economic theory and the behavioral theory of the firm. Rather than being separate, distant views of the world – they may need each other to develop a rich understanding of their research questions. In an ironic twist, the work on the behavioral theory of the firm may lie at the heart of price adjustment, and therefore economics, while economics may also lie at the heart of the behavioral theory of the firm, and therefore organizational theory. We suggest that price adjustment may offer a natural common ground for economists and organizational scholars to work together on questions of mutual interest. But to achieve real common ground they'll need to move to higher ground, each realizing that the other discipline lies at the heart of its central issues.

5. Conclusion

The goal of this paper, and the ethnographic methods underlying it, are ones of a discovery. By "going native," and living with managers making these decisions we are able to observe pricing at a level of micro-economic detail that is rarely available to academics that study these problems. This depth of exposure allows us to generate new insights into pricing processes, led to the lessons presented in this paper, and suggest that the central lesson of our paper is that economics works, just not the way we think it does.

Although the paper presents one vivid pricing example in great detail, these themes were consistent with the standard operating procedures of this firm, and many of its customers, across a variety of other price adjustment decisions (see Zbaracki et. al.

2005). Moreover, these candidate sources of organizational costs of price adjustment seem likely to exist in other business to business organizations. Although the exact questions, complexities, partial models, conflicts, uncertainty, convexity, and organizational processes may vary, most large firms seem likely to face these issues to some degree. Most firms sell multiple products to multiple customers through distribution channels, and have to figure out end customer reactions, competitive reactions, distributor reactions, and organizational implications of any price adjustments they make. Most large firm have different functions, be they sales, marketing, finance, operations, different divisions, etc. As such, these themes seem likely candidates at any major organization trying to grapple with price adjustment.

Future work exploring the generalizability of these costs across other firms, other industries, and other countries would be valuable. Additional ethnographic field work would be most valuable in contexts that would allow exploration of other costs, or the boundaries of these issues. Survey and interview methods that allow wider coverage of firms and industries may be useful to uncover the scale and scope of these issues across broad sectors of the economy. Exploring the implications of these costs of adjustment would also be valuable. Theoretically, exploration of how firms compete when economics is done with partial models, deep uncertainty (or ambiguity) on fundamental variables, or when facing convex organizational costs may generate a variety of new insights and implications. Empirically, testing whether variation in price rigidity is related to these kinds of costs, or the theoretical implications of these costs, would be valuable. There also seem to be promising directions for future research exploring the organizational behavior and sociological dimensions of price adjustment (see Zbaracki 2005; Levin, 2005). Finally, organizational sources of price adjustment seem to be a promising area for cross-disciplinary research between economics, marketing, strategy, organizational behavior and sociology.

References

Amato Jeffrey D. and Thomas Laubach (2003), “Rule-of-Thumb Behaviour and Monetary Policy,” ***European Economic Review***, Volume 47, Number 5, October, 791–831.

Ball, Laurence, and N. Gregory Mankiw (1994), “A Sticky-Price Manifesto,” ***Carnegie-Rochester Conference Series on Public Policy***, 127–152.

Ball, Laurence, N. Gregory Mankiw, and Ricardo Reis (2005), “Monetary Policy for Inattentive Economies,” ***Journal of Monetary Economics*** 52, 703–725.

Basu, Susanto (2005), “Comment on: [Dotsey and King’s (2005)] Implications of State-Dependent Pricing for Dynamic Macroeconomic Modeling,” ***Journal of Monetary Economics*** 52, 243–247.

Bewley, Truman F. (1999), *Why Wages Don't Fall During a Recession* (Cambridge, MA: Harvard University Press).

Bewley, Truman (2002), “Interviews as a Valid Empirical Tool in Economics,” ***Journal of Socio-Economics*** 31(4), 343–353.

Bewley, T. and W. Brainard (1993), “A Depressed Labor Market, As Explained by Participants,” Yale University, February, mimeo.

Blanchard, Olivier and Stanley Fischer (1989), *Lectures on Macroeconomics* (Cambridge, MA: The MIT Press).

Blinder, Alan S., E. R. D. Canetti, D. E. Lebow, and J. B. Rudd (1998), *Asking About Prices: A New Approach to Understanding Price Stickiness* (New York, NY: Russell Sage Foundation).

Carlton, Dennis W. (1986), “The Rigidity of Prices,” ***American Economic Review*** 76, 637–58.

Carlton, Dennis W. (1989), “The Theory and the Facts of How Markets Clear: Is Industrial Organization Valuable for Understanding Macroeconomics?” in *Handbook of Industrial Organization, Volume 1*, edited by Richard Schmalensee and Robert D. Willig, (Amsterdam: North Holland), pp. 909–946.

Carlton, Dennis W. and Jeffrey M. Perloff (1994), *Modern Industrial Organization* (New York, NY: Harper Collins).

Cecchetti, Stephen G. (1986), “The Frequency of Price Adjustment: A Study of the Mewsstand Prices of Magazines,” ***Journal of Econometrics***, Volume 31, 255–274.

Cyert, Richard M. and James G. March (1963), *A Behavioral Theory of the Firm* (Englewood Cliffs, NJ: Prentice Hall).

Dotsey, Michael and Robert G. King (2005), “Implications of State-Dependent Pricing for Dynamic Macroeconomic Modeling,” ***Journal of Monetary Economics***, Volume 52, 213–242.

Fabiani, Silvia, et al. (2004), “The Pricing Behaviour of Firms in the Euro Area: New Survey Evidence,” ECB-IPN Working Paper.

Galí, Jordi and Mark Gertler (1999), “Inflation Dynamics: A Structural Econometric Analysis,” ***Journal of Monetary Economics*** 44(2), October, 195–222.

Gordon, Robert J. (1990), “What is New-Keynesian Economics?” ***Journal of Economic Literature*** 28, 1115–1171.

Kashyap, Anil K. (1995), “Sticky Prices: New Evidence from Retail Catalogues,” ***Quarterly Journal of Economics*** 110, 245–274.

Levin, Peter. (2005). “Information, Prices, and Sensemaking in Futures Trading,” Working Paper, Department of Sociology, Barnard College.

McCallum, Bennett T. (1986), “On Real and Sticky-Price Theories of the Business Cycle,” ***Journal of Money, Credit, and Banking*** 18(4), November, 397–414.

Milgrom, P.R. and D.J. Roberts (1988), "An Economic Approach to Influence Activities in Organizations," ***American Journal of Sociology*** 94, 154−179.

Nelson, Richard and Sydney Winter. 1982. ***An Evolutionary Theory of Economic Change.*** Cambridge, Mass: Harvard University Press.

Prescott, Edward C. (1987), “Comment [on Rotemberg (1987)],” ***NBER Macroeconomics Annual***, 110–114.

Rotemberg, Julio J. (1987), “The New Keynesian Microfoundations,” ***NBER Macroeconomics Annual***, 69–104.

Rotemberg, Julio J. (2005), “Customer Anger at Price Increases, Changes in the Frequency of Price Adjustment, and Monetary Policy,” ***Journal of Monetary Economics***, Volume 52, 829–852.

Rotember, Julio J. and Garth Saloner (1995), "Overt Interfunctional Conflict (and Its Reduction through Business Strategy," ***Rand Journal of Economics*** 26(4), 630−653.

Sheshinski, Eytan and Yoram Weiss (1977), “Inflation and Costs of Price Adjustment,” ***Review of Economic Studies*** 44, 287–303.

Sheshinski, Eytan and Yoram Weiss (1992), “Staggered and Synchronized Price Policies under Inflation: The Multi-product Monopoly Case,” ***Review of Economic Studies*** 59, 331–359.

Sheshinski, Eytan and Yoram Weiss (1993), *Optimal Pricing, Inflation, and the Cost of rice Adjustment* (Cambridge, MA: The MIT Press).

Slade, Margaret E. (1996), “Sticky Prices in a Dynamic Oligopoly: An Investigation of (s, S) Thresholds,” The University of British Columbia, Manuscript, March.

Slade, Margaret E. (1998), “Optimal Pricing with Costly Adjustment: Evidence from Retail-Grocery Prices,” ***Review of Economic Studies*** 65, 87–107.

Spradley, James P. 1979. ***The Ethnographic Interview***. New York: Harcourt Brace Jovanovich.

Stiglitz, Joseph (1984), "Price Rigidities and Market Structure," ***American Economic Review*** 74(2), 350−356.

Zbaracki, Mark, et al. (2004), “Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets,” ***Review of Economics and Statistics*** 86(2), May, 514–533.

Zbaracki, Mark J. (2005), “Pricing Structure and Structuring Price”, Working Paper, Wharton School, University of Pennsylvania.

Zbaracki, Mark, Mark Bergen, and Daniel Levy (2005), “Pricing as an Organizational Problem: Evidence and Frameworks”, Working Paper, Wharton School, University of Pennsylvania.

Table 1. Organizational Consensus on the Economic Forces Driving a Price Reduction

Economic Variable	Marketing	Sales
Lower variable costs	"We have integrated … production into the company and took about 30 percent of our product cost out as a result of that." –Vice president for aftermarket	"On [our newest product line] … We adjusted our prices accordingly to where we were a lot more competitive on a [list price to list price] relationship which in turn on a cost to cost relationship we are better as well." –Sales representative
Customer price sensitivity	"It is a highly price sensitive market. No question in my mind about that."	"I have one [major customer] that buys about one hundred thousand a month by themselves and you can't change their price. If I had changed one [part number] in that place [our major competitor] would have been there in a heartbeat. …If we don't advance it or adjust to it then somebody will."—Sales representative
Customer perception of a lack of product differentiation	"I spent an awful lot of time managing the testing of competitive products and slowly and very surely there is no obvious differential between the products." –Pricing director	"We are not the high priced product in 1998. A lot of difference has happened in 13 years. The name don't [sic] mean as much." –Sales representative
Over priced relative to competition	"The people who did know about us considered us one thing: high price." –Director of pricing	"That is where we [are] high on - on the [newest] product line." –Sales representative "I could go in and quote a customer on [the core product line] and knock the doors off them but when it came to the [newest line] I couldn't come close." –Distributor

Table 3. Additional Questions underneath the Organizational Consensus on the Economic Forces Driving a Price Reduction

Economic Variable Marketing and Sales Agree On	Additional Questions
Lower variable costs	How do these costs vary by customer?
Customers price sensitive	Which customer to focus on: end user customers or distributors? Does price sensitivity vary across segments of end customers or distributors? Which prices are they more sensitive to: list price or discounts?
Customers perceive a lack of differentiation	Which customer to focus on: end customers or distributors? Does differentiation vary across segments of end customers or distributors?
Overpriced relative to competitors/market	Which customer to focus on: end customers or distributors? Does competitive position vary across segments of end customers or distributors? What are their competitors' market strategies? How to signal their intentions to competitors? How is each competitor likely to react to a price cut? Across products? Across customers?

Table 2. The Two Views Compared

Economic Concept	Marketing	Sales
Variable costs	Decreased	Decreased
Recommended action	Cut list prices	Increase discounts
Customer		
End customers	**Major focus: Price reduction should target them**	
Distributors		**Major focus: Discounts should be targeted to distributor circumstances**
Price focus	List price	Discounts
Price sensitivity	Greater for list price	Greater for discounts
List price sensitivity	**Significant**	None
Discount price sensitivity	Limited	**Significant**
Segmentation	Across product lines	Across distributors
Competition	Broad market position Signaling across all product categories	Bid level Trying not to lose the bid on price
Pass-through	List price is effective	Discounts effective
Data focus	Aggregate sales Across product lines	Bid focused Winning the bid