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

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Abstract

We use qualitative data to analyze the key elements of the price adjustment processes used at a large industrial manufacturer and several of its major customers. We focus on a specific episode, a price cut, which most vividly exemplifies the themes that emerge from our data. In the specific episode, market forces clearly dictate that the firm should cut prices, and everyone in the firm agrees with this assessment, suggesting a fairly straightforward decision where the organizational price adjustment costs ought to be low. 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. We document four specific organizational themes that emerge from the analyses of the data. (1) Each manager or each group within the firm handles only a part of the economic complexities of a given problem, using partial (albeit coherent) models of the marketplace. (2) Yet, when viewing the organization as a whole, across the different managers and groups, most of the economic complexities are dealt with. Thus, economics is not being done by individuals; rather it is an organizational issue. (3) The partial models used by managers may compete, conflict or collide creating organizational costs of price adjustment. (4) These frictions raise deep organizational issues which need to be resolved, suggesting an additional source of adjustment costs.

"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." **Andrew Caplin and John Leahy (1995)**

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

1. Introduction

Menu costs, i.e., physical costs of changing prices, have been used extensively to model sluggish price adjustment.[1] Recently, however, there has been a growing interest in the managerial and organizational aspects of the costs of price adjustment. 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.[2] The most recent example is Rotemberg (2005), who expresses the view that "… these administrative costs simply cannot be the whole story" (p. 830).

Many 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 component of price adjustment costs. Several authors, 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, p. 619), and that "… the price change process reveals a series of managerial activities of vast scope and complexity" (Zbaracki, et al. 2004, p. 518). Similarly, Ball and Mankiw (1994, p. 142) express the view "… 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."

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

[1] See, for example, Mankiw (1985), Blanchard and Kiyotaki (1987), Caplin and Spulber (1987), Ball and Romer (1990, 2003), Caballero and Engel (1991, 1993), Caplin and Leahy (1991), Ball and Mankiw (1994), Blinder, et al. (1998), Danziger (1999, 2007), Barsky and Warner (1995), Dotsey, King, and Wolman (1999), Fisher and Konieczny (2000, 2006), Konieczny and Skrzypacz (2003, 2004, 2005), Davis and Hamilton (2004), and Dotsey and King (2005). See also the edited volumes by Mankiw and Romer (1991), Sheshinski and Weiss (1993), and Levy (2007).

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

debate on time-dependent versus state-dependent models of nominal price rigidity.[3] 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.

Despite this growing interest, however, little is known about how organizations actually go about adjusting prices, what the sources of the price adjustment costs really are, and why it is so difficult for organizations to adjust prices. 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.

A natural way to address this issue is to go directly to the source—managers and organizations adjusting prices, and observe how they do this. There have been calls in the literature in this direction. For example, Caplin (1993, p. 21) calls for "… more detailed empirical work and for increased understanding of the manner in which corporations actually arrive at pricing decisions," while Blinder, et al. (1998) suggest "… going to the source of price change activity—the managers who change the prices—to gain insights about pricing," and Rao (1984) states that "… the benefits of knowing more about decision processes of how industry managers go about determining [and changing] prices for their products are quite apparent."

In this paper, our goal is to shed some light on the organizational sources and on the nature of the costs of price adjustment using unique data. The data comprise the qualitative component of an intensive two-year cross-disciplinary ethnographic analysis of the pricing practices of a one-billion dollar Midwestern industrial manufacturing firm and several of its major customers.[4] The company is a market leader in its industry, and sells more than 8,000 different products. We combine three data sources: (i) open-ended tape-recorded ethnographic interviews with the individuals who were involved at various

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[3] See also, Sheshinski and Weiss (1977, 1992, and 1993), Blanchard and Fischer (1989), Romer (2001), and Klenow and Kryvtsov (2005).

[4] The more quantitative analysis can be found in Zbaracki, et al. (2004).

stages in the price adjustment process, (ii) non-participant observations made during a wide variety of pricing activities, and (iii) internal company data and records.

In this study, we present a detailed analysis of a single and very specific episode of a price adjustment decision, in our case a decision about a major price cut, which we believe most vividly demonstrates the nature and the sources of the organizational difficulties, frictions, disputes, and tensions, that contribute to the micro-level price inertia. In the particular price cut episode we study, the market forces clearly dictate that the firm should cut prices, and everyone in the organization agrees with this overall 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. Yet 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, hindering the firm's ability to adjust prices.

We find that price adjustment at its core is an organizational problem. The ability to manage the disparate knowledge, analyses, models and human elements in the organization is central for price adjustment. The "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, that 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 quite coherent, and consistent with the data and realities 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 might be moderated 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.

To briefly summarize our findings, we identify four specific organizational themes that emerge from the analyses of the data. (1) Each manager or each group within the firm handles only a part of the economic complexities of a given problem, using partial (albeit coherent) models of the marketplace. (2) Yet, when viewing the organization as a whole, across the different managers and groups, most of the economic complexities are dealt with. Thus, economics is not being done by individuals; rather it is an organizational issue. (3) The partial models used by managers may compete, conflict or collide creating organizational costs of price adjustment. (4) These conflicts raise deeper organizational issues which need to be resolved, suggesting an additional source of adjustment costs.

The paper is organized as follows. In section 2, we briefly describe the data and the methodology. In section 3, we discuss the economic forces that pushed the company towards making the price cut decision and describe its implementation process with a particular emphasis on the organizational frictions that were generated by the price cut decision. In section 4, we discuss the major themes that emerge from our data. In section 5, we discuss the implications of these findings in the context of the existing literature on the cost of price adjustment. Section 6 concludes.

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 countries.

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 revenue. 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 customers across the US, including one original equipment manufacturer. From those customers we obtained a broad range of details on the price adjustment processes and the customer implications of these processes. In total our research team spent over 720 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 was 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 several customer firms 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/survey 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.[5] 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 labor intensive, as well as more complex and challenging for use and

[5] See, for example, Blinder, et al. (1998) as well as numerous studies that followed it, including the European Central Bank's Inflation Persistence Network studies, such as Fabiani, et al. (2004) and the studies cited therein.

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.[6]

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 assembled the third dataset from the company's internal 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 such as documents defining the proposed pricing direction for the next year, documents used by the finance group 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.

3. The Anatomy of a Price Cut

In this paper we focus on one event, a single price cut episode, which we believe most vividly illustrates the true nature of the process of price adjustment and the complex and intense organizational activities that take place during that process. After offering an

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[6] 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, 2002, and 2007).

overall picture of the price change process, we describe the economic forces that necessitated the price cut as the managers at the company understood them. We then turn to the organization's implementation of the price cut, paying particular attention to the views that the marketing and the sales group members held about the price cut and about the necessary steps.

3.1 The Company

Each year, beginning in July or August during what the company management calls the "pricing season," the company sets/adjusts the prices for the 8,000 products. The firm divides the responsibility for different aspects of pricing among different groups within the organization—giving the list price responsibility to the corporate marketing group and the negotiated price responsibility to the field sales force, who sets the specific discounts for each individual bid. In general, the two groups set the prices in a sequential process, beginning with changing list prices, and following with more specific negotiations on a customer by customer basis. If customers demand a re-negotiation during the year, the firm has a sequential process working in the opposite direction. The salesperson recommends an adjustment and this requires the approval and sometimes the support and involvement from the corporate people with the levels of corporate involvement escalating with the level of the recommended price adjustment.

When making these price adjustment decisions, managers in each group used a variety of factors that are consistent with constructs from marketing, economics and organizational domains. In Table 1 we list the key factors that were most relevant to their pricing routines and decisions. These include marketing and economics constructs such as costs, margins and profitability, company strategy and goals, elasticity, value and differentiation, competition, channels of distribution (i.e., end customers, distributors and pass-through), segmentation, and incentives, as well as organizational constructs.[7]

Before we proceed with the discussion of the price cut, we shall briefly mention two organizational constructs particularly relevant for these two groups—status and identity.[8] There is a long literature on the importance of status and power in companies,

[7] Zbaracki, et al. (2007) offer a more detailed analyses of the pricing routines used by these firms, the constructs that emerged from the study of their price setting and price adjustment processes, and the native language and tools used by managers to address these constructs.
[8] In Zbaracki, Bergen and Levy (2007) we study the price adjustment processes of this firm both in terms of the language of practice (the steps and words they used to describe their processes and routines) and in terms of the relevant economic and organizational theory. We find that the price adjustment processes used by this firm grappled with a large number of economic and organizational issues. We choose two of the organizational issues we uncovered to highlight these organizational dimensions and help identify their role in price adjustment process and decision.

and its role in organizational decision-making (see, e.g., Fligstein, 1996). This literature suggests that the economic theories and the processes that firms employ for implementing them, may be used for more than just their instrumental purposes. For example, they can be exploited for obtaining, enforcing, and maintaining control, power, legitimacy and status, much as machines and drawings are used in Bechky's (2003) study of equipment manufacturing.

By identity we mean the way managers view themselves in their daily lives. For example, what may make sense in abstract theory may not make the same kind of sense when it encounters the everyday reality that people create. We introduce identity in practice (Hutchins, 1995) and negotiated order (Barley, 1986; Orlikowski, 2000) as organizational constructs because we discovered that they are very relevant to issues of price setting and price adjustment.

In terms of status during our data-gathering period, the marketing group was populated by middle managers with expertise in finance and accounting in addition to marketing. The group had some status at the company headquarters including the VP's office but it was below upper management in terms of their status in the company. During the time of our study, we discovered that the ability of this group to push towards new corporate strategies and goals was a source of status. This often put a premium on such areas as finance, accounting and consumer behavior depending on the strategic objectives for that year.

The sales force status was being challenged by the marketing group during the period we gathered the data, viewing them as an expense that could be eliminated, and pushing towards identifying additional value the sales force could bring to the table. Thus, the corporate marketing group had greater status in the company than sales. The sales force did have status with the VP and the upper management who had been in the field and had been with the company for a long time. The sales force also had status with the customers, who saw them as the direct link and personal relationship to the company. Finally, both groups spoke of the status this company had in the marketplace – relative to competitors as well as in their customers' eyes. They were proud of the company's position as a market leader in terms of its product quality. But they were also concerned about challenges to that high status position in the marketplace.

In terms of identity, the marketing group members viewed themselves as pricing experts, which tied directly into their abilities to gather and analyze data, work with the

data to analyze the financial implications of the proposed price changes, and assess how they impacted corporate goals. They also saw themselves as having a broader view of the marketplace, in a position to see the big picture of pricing decisions for end customers, competitors and the company. The sales force saw themselves as experts on their direct customers, distributors, which tied directly with their experience and time spent in the field with these customers. They also felt they had a better understanding of the specific market conditions they faced, and were therefore in a better position to negotiate bids. They also felt they were an important source of information for the pricing decisions made by the firm. Both groups saw themselves as the defenders of the company's status in the marketplace relative to competitors and in the eyes of their customers. Also, both felt they were important to the survival and success of the firm in the marketplace.

3.2 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 high relative to the competition. Moreover, the other aspects of price adjustment these group looked at when adjusting prices did not diminish the need for a price cut. See Table 1.

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 rationale 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 becoming price sensitive, especially 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 [I discover that] 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 rationale was technological. The product line was a late addition to their offerings, and production had been outsourced to other suppliers. Another part of this rationale 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 the proposed price cut was in part necessitated by the market forces, 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. Everyone in the organization agreed that the firm should reduce prices on that product line. They also all agreed on the economic rationale supporting a price cut. But how to cut and by how much to cut prices were still to be decided. See Table 2 for a summary of the evidence.

3.3 Implementing the Price Cut

To determine 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 organizational frictions that could make the actual price adjustment decision particularly costly.

The price cut decision and its implementation, however, turned out to be a remarkably contentious and costly process. Members of the marketing group proposed lowering the 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 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.

3.4 The Marketing Rationale

The marketing group's rationale was driven by the assessment that the price to the end customers was too high, and that the price cut was 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 high-volume parts in the market. In his words, "*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 rationale supporting the price cut at headquarters. As one 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 to 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. The list prices were the only published prices, and they were included in the CD's and in the books that were mailed to all distributors.[9] Moreover, distributors often showed the list prices to end customers to justify the prices they charged. List prices were also most visible to the firm's competitors. Furthermore, 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 in contrast, were customer-specific and thus varied from customer to customer. Also, they were too hidden and fragmented—and thus not as easily visible to end customers. They, therefore, were of a limited use as a communication and signaling tool to competitors in the marketplace.

The marketing group 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 the overall marketplace that they so stridently longed for. They believed that the visibility of the list prices would make the reduced prices more likely to be passed through from distributors to end customers. Further, they reasoned that end customers would be more likely to be informed 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 it 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 the 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 served an additional function, 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

[9] Their own data base of competitive prices was created from the competitors' list prices gathered from the marketplace.

planning and for evaluating revenue, profitability and growth goals. These analyses and evaluations aggregated price information across all products. Given their assumptions about the price sensitivity of the end customers, the marketing group members were expecting 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 conducted frequent analyses to see whether the list price cut could be profitable and whether it could meet the company goals. Nevertheless, the consequences of the price change for the volume sold, for revenues, and for the profits were still the greatest source of uncertainty in the marketing group's 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 staff at the headquarters distrusted rebates because they viewed the sales force as being incapable of cutting the end customers' prices effectively. They believed that discounts and rebates would not accomplish the task of repositioning the product line and clearly communicating that repositioning to end customers and the competitors because they were specific to individual customers, and too fragmented to serve as a useful communication and signaling tool in this marketplace. The director of pricing was also concerned about the costs of managing and processing discounts, rebates and other negotiated pricing terms.

This was a common view at the company 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 rationale of the marketing group rested on their assessment of end customers, on the expected 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 the price 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 3 for a summary.[10]

3.5 The Sales Force Rationale

The sales group's rationale 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 company's 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 main* 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.*"

[10] This rationale was consistent with the marketing group's role in the standard operating procedures for price adjustment at this firm. In fact, this focus of the marketing group on the end customer, list prices, aggregate consumer data and behavior, limited study of distributors and of 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 and Bergen (2007) and Zbaracki, et al. (2007).

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, 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 rationale 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 market 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 bought different combinations of products, the sales force found that price sensitivity varied across customers and bids. Consequently, they believed that the revenue, profitability, as well as growth potential, all 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 offered 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 respond to the variations in market conditions when adjusting prices. For example, the VP stated that we "… *provide a discount structure that tries to deal with the market structure*." Similarly, 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, for example, when the firm needed a particularly competitive price.

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.*"

The sales people also evaluated the revenue, the profitability and the growth implications at the bid level, and therefore, from their point of view, the list price only mattered as the base for the distributor's acquisition price. They used the final price, net of discounts, 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 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. Their rationale 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 price reductions to end consumers, their use of acquisition - (rather than just the list-) prices in analysis, and their concerns with the capabilities of the marketing group to use list prices for accomplishing the main goal. This rationale was consistent with the sales group's role in the standard operating procedures for price adjustment at this firm. For a summary, see Table 4.[11]

3.6 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.[12] 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. Themes Emerging from the Data

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 decision lie a remarkably rich tapestry of organizational frictions, which offer insights into the organizational sources of the costs of price adjustment. Although all members of

[11] In fact, this focus on the distributors, discounts, and segmentation, along with their limited focus on 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 and Bergen (2007) and Zbaracki, et al. (2007).

[12] For more information on the vice-president's decisions, and other more sociological dimensions of this price adjustment decision, see Zbaracki and Bergen, 2007.

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 difficult to decide. We present four major themes that emerged from this data. These themes were true in a wider variety of situations, albeit in less extreme forms, throughout our 2 year field study with this firm and its major customers.

4.1. Partial (Albeit Coherent) Economic Models

The picture one gets from observing this 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. For example, the marketing group's rationale and rational dictates that they pay no attention to distributors, segmentation across distributors, specific bids, etc. Similarly, the sales force's rationale and rational dictates that they pay no attention to end customers, aggregate data, broader competitive signals, the role of list price, etc.

The models are also partial from an organizational perspective because they do not capture nor reflect the goals, the problems, the issues, and the questions facing the members of the other groups. 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 perform sophisticated analyses on the extent of the price sensitivity of "… *their constituencies*" via statistical methods and analysis. Also, because the structure of the price setting and price adjustment decision process 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 (list and bid) of all the products to all major customers.

At the same time, our results suggest that in large organizations of the type we study, each group within the organization operates using a fairly *coherent model* of (what they consider) "optimal" price setting. Consider, for example, the marketing group's partial model, as shown in Table 3. Their rationale 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 could be best 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, as outlined in Table 4. Their job required that they focus on distributors, and therefore naturally believed that the distributors are the ones that 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.

4.2. Organization Covers Many Aspects of Economic Models

Placing the two partial models used by the marketing and sales groups side by side in Table 5, we find that they cover different aspects of economics that need to be considered to make pricing decisions. This is true at the level of each specific economic

tool, as well as the overall use of economics. We find that the firm considers a wide variety of factors in the marketplace. Moreover, the firm examines some of the key economic factors in depth, gathers and assesses information from a wide variety of sources, perspectives, and points of view, and employs various sources of knowledge, experience, tools and analyses. Thus, we find that organizations use economics, but not necessarily in the way we think they do. The organizations' ability to use economics is directly impacted by organizational processes, routines, variables, biases and constraints as the company's pricing managers try to combine these information and tools into a useable input into their pricing decision.

4.2.1 Specific Economic Tools

Economic tools are seen as rows in Table 5. Consider competition as an example. The marketing group considered competition at the aggregate level, trying to understand how competitors were positioned in the marketplace, and trying to understand competitive actions and likely reactions, for specific product categories. During our data-gathering period, these managers were in the process of developing better data bases, tools and processes to allow them to better understand competition from the aggregate data. They were trying to send clear signals in the marketplace, and trying to uncover changes in the competitive landscape as quickly and effectively as they could. The sales group considered competition at the level of the individual customer and bid, using languages like "the bid is at risk" revisiting in that specific context how competitors were seen, and likely to bid, with the customers given the specific market factors. Salespeople used their experience, relationships, and past bids, both won and lost, to assess competition.

Each group also chose to focus on different customer groups at different levels of the channel of distribution when it came to competition. The marketing group was concerned about market position and competition in the eyes of the end customers. They commissioned marketing research on end customers, and were looking for visible signals from competitors and from demand changes that could help them better understand how they were perceived by their customers relative to competitors across their product lines. The sales group was concerned about their direct customer – the distributors. They were keenly aware of their distributors' competitive pressures, business conditions, relationships and past purchase decisions and used this to assess the competitive realities of their distributors on a bid by bid basis.

Additional issues that emerge from our data are related to the analysis of margins and profitability, price sensitivity, segmentation, pass through, etc. For example, financial analysis of the bids was developed in great detail by the marketing group, as they assessed the likely impact of price adjustments on revenues, profitability and other corporate goals. This was revisited, with less analysis but greater specificity, by the sales force during the bidding process. Each group evaluated these economic factors using different data, different tools, different perspectives on customers, different perspectives on the impact on the company, and different factors in the marketplace.

4.2.2 Overall Use of Economics

Comparing the partial models of marketing and sales side by side in Table 5, one can see gaps in the models, or only partial dimensions of the tools, being applied by any particular group. Yet considered as a whole, across the entire organization, these processes do cover many of the central components of economic analysis. The pricing process covers these economic criteria by allocating decisions over different aspects of the price adjustment process to the marketing group and the sales force. As a solution to the ongoing problem of price adjustment, this process was fairly effective, especially for small changes.

Consider, for example, how the separation of the pricing tasks between the marketing group (which handled the list prices), and the sales group (which handled the discounts) enabled the firm to respond to large market-level changes on an annual basis, and at the same time to adjust to idiosyncratic changes on a customer-by-customer basis throughout the year, if required. The marketing group focuses on the aggregate aspects of the pricing problem, general market trends and issues, and on the overall impact of pricing on the corporation and its strategic planning and goals. This includes trends in sales across products, broad market perceptions, information about end customers further down the supply chain, costs and profitability, etc. These aspects of economics are needed to ensure that prices are responsive to changes in the overall market forces and major competitive actions.

The sales group focuses on the variation in specific market situations. The aggregate perspective hides a great deal of individual variation in the effectiveness of price changes across individual bids. They focus on specific customers and on changes in their market conditions, on the implications of price changes for those customers, on whether or not their business is at risk, etc. These aspects of economics are needed to

ensure that prices are responsive to the economic realities of the specific micro-level situation in which the prices are adjusted.

Moreover, the very things the marketing group ignores – distributors and segmentation, are at the heart of the sales force's process. Similarly, what the sales group ignores - market level positioning, signaling, competition and financial analysis, are at the heart of the marketing group's list price setting and price adjustment process. Thus, in general, most of the major economic issues and considerations are addressed by someone in the organization. However, no single group or individual used/considered them all when adjusting prices. On the whole, most aspects of economics are considered to some degree, and many critical aspects of economic factors such as competition, profitability, etc., are considered in great detail, at the aggregate market, individual market, and multiple customer levels.

4.3. Colliding Partial Models

While the organization as a whole may cover many aspects of economics, the partial models also create possible areas of disagreement and conflict. See Table 5. Consider, for example, the four economic factors that drove the price cut, upon which both groups agreed as they entered into the price cut decision phase. These partial models hide a variety of additional questions, on some of which they disagreed sharply, which led to diverging views on the necessary price change 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 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.

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. The group members disagreed 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 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. For example, the pricing team members disagreed also 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 the general market prices?

These disagreements point toward the inherent complexity of price adjustment decisions in multi-firm and multi-product business-to-business transaction settings. They suggest that what may appear as fairly trivial components of price adjustment decisions, such as price, quantity, consumer, and market, are far from trivial. The organization members disagreed, often quite sharply, on the interpretation of each one of these components depending on their own rules and 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.

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 conflicts—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, to which they have no answer 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 bear far lower 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 used by 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 perhaps a larger component of the costs of price adjustment facing an organization.

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 extent of the consistency/inconsistency 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 case in the specific price cut episode we studied.

Thus, 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 a direct source of the frictions and barriers to flexible price adjustments within the organization and thus, the direct source of the organizational costs of price adjustment.

4.4. Deeper Organizational Costs of Price Adjustment

The focus on the marketing and economics aspects of the price adjustment problem hides additional organizational dimensions of the price adjustment process. We find two levels at which organizational factors rest at the heart of the ability to adjust prices. First, the partial models create a friction that cuts to the heart of organizational concerns and constructs such as status, identity and trust. The partial and colliding nature of how economics is done in organizations exacerbates these concerns and creates fuel for fires at deep and fundamental levels. Second, the partial models used in price adjustment are insufficient to resolve these organizational problems. For example, it is

not enough to apply each partial model more completely – the underlying issue is which partial models to explore, and where to put resources to explore them. The necessity to confront these deeper decisions imposes on the company management the burden of answering the fundamental economic questions that underlie these frictions.

4.4.1 Economics and Organizations—Status, Trust and Identity

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. For example, notice that among the missing variables of each group's model, are key variables of the other group's model. 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.

Consider the consequence of the 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 and routines 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 marketing and economics 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.

This cuts at the core of organizational issues such as status, trust and identity. The models each group is using are deeply embedded in their identities of how and what they contribute to the organization, and are part of their legitimacy and status within the organization. When these are violated, more than market forces and economic issues are questioned and discussed – the very core of who they are and where they stand in the organization is being challenged. To the degree that others are ignorant or derisive of their partial models, the costs in damage to trust can be substantial.

4.4.2 How to Solve These Problems

This price cut episode, and our 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. That issue is a deeper uncertainty about how to resolve these questions and conflicts. The uncertainty was not about whether or not to reduce prices, which is the type of uncertainty discussed, for example, by Stiglitz (1984) or Blinder, et al. (1998). The 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 a series of unresolved questions and conflicts. There seems to be an inherent uncertainty in how to answer these questions and resolve these conflicts.

Possible responses to these kinds of deep, fundamental organizational questions and conflicts would be to try to get more data and information, and perform additional

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 analyses of market data to measure sensitivity. Similarly, disagreements on the importance of list prices to end users could be resolved by using techniques that are designed to measure customer values and perceptions using tools such as customer interviews and surveys. Uses of discounts could be (and often were) supported by simple calculative tools that analyzed the effects of a discount on profitability. However, at the time of the disputes, there were no such data available to use for these types of analysis. Resolving the disputes with analysis, therefore, would require allocation of resources to the task of gathering and analyzing data. Advocating such analysis, however, risked extending the dispute from the right action to the right way to analyze what would be the right action. Moreover, the partial models used to decide on the price cut cannot solve this conflict, because a decision needs to be made about which partial model to use.

Another approach to dealing with this fundamental uncertainty is to appeal to organizational solutions, such as hierarchy. Indeed, this was the method adopted by our firm by appealing to the VP of marketing to make the call. 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 engage in lobbying activity. Clearly these activities are part of the organizational costs of price adjustment. However, there are costs beyond these kinds of goal and incentive conflicts. Recall the 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 the firm 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 prices 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, even if they wanted to.

It seems likely that this deeper level of uncertainty, and the need for additional mechanisms beyond the partial models that were used to make the price adjustment decisions, may be a major source of the organizational costs of price adjustment.

5. Discussion

"*… 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 results suggest that the organizational costs of price adjustment run deep. They are related to the partial models managers must use to deal with the complexity of the pricing task they face. Although as a whole, organizations can handle many and perhaps even most economic considerations, the realities of the partial models they use and the constraints under which the organizations operate, lead these models to collide at which point the very economics they are trying to do by adjusting prices, in effect becomes a cost of price adjustment. These gaps and discrepancies between the partial models can interact with organizational issues and constructs such as status, trust and identity increasing these costs even further. Moreover, the difficulties in deciding which model to use raise a deeper level of organizational costs and lead to decision-making barriers.

Our data supports a view that the organizational costs of price adjustment are convex in settings where price adjustment process has a substantial managerial and organization component, i.e. they are likely to increase with the size of the price change (Cecchetti, 1986; Rotemberg, 1987). When the price changes are larger, the processes we observe are likely to entail more resources such as more analysis, more discussions, and more iterations. The data suggest 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 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 often take home with them. As

demonstrated above, these frustrations and complaints were frequently openly addressed in the ethnographic interviews we have conducted.

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 important 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.

Our results provide direct evidence supporting Basu's (2005) contentions about the role of organizational costs of price adjustment in the debate about state-dependent versus time-dependent models of price adjustment. The separation of price adjustment decisions between marketing (list prices) and sales (negotiated prices) allowed the firm we study to have both time-dependent (annual pricing season to set the list prices) as well as state-dependent (individually negotiated prices, depending on the market conditions) aspects to their price adjustment process.

Our results can be interpreted as supporting the theoretical arguments that are made by recent studies that employ various versions of sticky information model such as Caballero (1989), Mankiw and Reis (2002), Ball, Mankiw, and Reis (2005), Bonomo and Carvalho (2004), Woodford (2003), Reis (2006), etc. For example, 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 findings we report supports also the modeling assumption adopted in a recent study by Klenow and Willis (2007). To explore the implications of sticky information model, they assume that information regarding macro state variables arrives in a staggered fashion. If new information does not arrive in the current period, then Klenow and Willis assume that the firm is not able to determine anything about the current innovation to money growth. This assumption requires that pricing managers not interact with the production managers or accountants within the firm, as otherwise they could see production or profits and draw inferences about current money innovations. Our findings suggest that the members of various divisions, such as marketing, accounting, finance,

sales, production, and other divisions do interact and communicate with each other. However, our data demonstrates that the members of these groups often disagree with each other. Moreover, they do not always consider the same data. For example, the marketing group at the company we studied focused solely on the aggregate data while the sales group considered only individual client-level data.

A central conclusion from this paper is that price adjustment is at its core an organizational problem, which provides strong support for continued efforts to study the economic implications of the organizational cost of price adjustment and its effect on price rigidity. This supports current work incorporating managerial capabilities and constraints into the ability of firms to adjust prices and react effectively to changes in market conditions.

The themes emerging from our study might shed some light on the question often raised by conference discussants, why firms don't use indexation as often as we think they ought to. The existence of partial models (theme #1) could help explain the limited use of indexation—if the partial model of a given group ignores the indexation variables, then the group will be unlikely to support its use. The fact that these partial models can collide (theme #3) adds another barrier to the organizational use of indexation. If the use of an index is only part of one partial model there may be frictions to its use. Moreover, if the index touches upon differences between the partial models that relate to the status, identity and trust between managers then the costs of this dialogue may far outweigh the economic benefits of the indexation for the organization. Finally, the organization will have to decide how to make the decision on what index to use—and this may require solutions to the problem of which partial model to choose, which may act as another barrier to the use of indexation.

We also find evidence of the use of rules of thumb in price adjustment (see, for example, Galí and Gertler, 1999, and Amato and Laubach, 2003). Some of these rules are quite direct and their use is necessitated by the sheer scope of the pricing task the company's pricing team faces on a regular basis. For example, we observed rules such as "competitor A plus 2 percent," or "competitor B minus 4 percent," or "last year's price minus 12 percent," being used in adjusting the prices. 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.

We shall note that 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. At the same time, however, they led to the creation and use of partial models and their implied organizational costs that made it hard to handle large price changes that were outside the scope of these heuristics, processes and routines. Thus, the routines themselves become a central source of rigidity, limiting the organization's ability to deal with major changes in the environment.

6. 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 studying these problems. This depth of exposure allows us to generate new insights into pricing processes, lead to the lessons presented in this paper. The central lesson of our paper is that when it comes to price adjustment decisions, economics works just not the way we think it does.

Although the paper presents a case study of one price adjustment decision in great detail, the themes we documented and discussed here were part of the standard and fairly routine operating procedures of this firm, and many of its customers, across a variety of other price adjustment decisions (see Zbaracki, et al. 2007). 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, 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, compete with multiple competitors, and have to figure out end customer reactions, competitive reactions, distributor reactions, and organizational implications of any price adjustments they make. Most large firms also

have organizational structures based on different functions of the sales, marketing, finance, operations, different divisions, etc. As such, these themes are likely to emerge at any major organization trying to grapple with the complexities of price adjustment decisions.

Finally, we would like to note two additional issues to which, we have discovered, our data and findings speak, although these issues are not directly related to questions of price rigidity and costs of price adjustment. First is related to the old marginalist debates (Hall and Hitch, 1939)—discussions on whether or not managers are using marginal costs and economic analyses in their processes and decisions. Eventually the position adopted by Friedman (1953) and others was that a deep understanding of what firms do is not essential—the key is the ability to predict. Price theory may not be descriptively accurate, but it has predictive validity. Managers possess price-setting skills that reflect the wisdom of the economists' models, even if they cannot articulate those skills in economist's terms (Machlup, 1946, 1967; Friedman, 1953). Our findings suggest that the marginalist scholars were correct that no single manager does all of pricing and all of economic analysis. But we also find that organizations do find a way to get economic analysis done, as the New Classical economists were arguing. Moreover, contrary to Machlup's argument (1946, 1967) that the skills of the "businessman" are irrelevant to the operation of the price mechanism, our data suggest that such skills are essential. It is precisely the ability of managers to handle all the disparate sources of data, the different people, their partial models and draw them together to react effectively to the events and developments in the marketplace, is in fact the quintessential pricing skill.

Second, many observations themes we encountered in the data, are consistent with work done on the behavioral theory of the firm. For example, theme #1 documents the use of partial models by managers. The literature on the behavioral theory of the firm (Cyert and March, 1963; Nelson and Winter, 1982) has emphasized the use of heuristics by managers. Themes #3 and #4, such as quasi resolution of conflict and uncertainty avoidance, seem directly linked to some of the central relational constructs of the behavioral theory of the firm (Cyert and March 1963, chapter 6.3).

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). In the existing literature, however, these conflicts are usually viewed as political or sociological in nature, whereas our data suggest that they have strong economic component as well.

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. Therefore, the concepts of complexity, uncertainty, latent conflict and truces are all developed at the level of social interactions in an economic vacuum.

We, in contrast, 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, motives, 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 by the firms. Likewise, latent conflict and quasi resolution of conflict may be related to the way economics is done. 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 offer a valuable research avenue in the future.

Future work exploring the generalizability of our findings across other firms, industries, and countries would also 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 the costs of adjustment would also be valuable. Theoretically, exploring 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 and Bergen 2007; Levin, 2005).

References

Amato, J. and T. Laubach (2003), "Rule-of-Thumb Behaviour and Monetary Policy," ***European Economic Review*** 47, 791–831.

Ball, L., and N.G. Mankiw (1994), "A Sticky-Price Manifesto," ***Carnegie-Rochester Conference Series on Public Policy***, 127–152.

Ball, L., N.G. Mankiw, and R. Reis (2005), "Monetary Policy for Inattentive Economies," ***Journal of Monetary Economics*** 52, 703–725.

Ball, L. and D. Romer (1990), "Real Rigidities and Nonneutrality of Money," ***Review of Economic Studies*** 57, 183–203.

Ball, L. and D. Romer (2003), "Inflation and the Informativeness of Prices," ***Journal of Money, Credit and Banking*** 35, 177–196.

Barley, S.R. (1986), "Technology as an Occasion for Structuring," ***Administrative Science Quarter*** 31, 78–108.

Barsky, R. and E. Warner (1995), "The Timing and Magnitude of Retail Store Markdowns: Evidence from Weekends and Holidays," ***Quarterly Journal of Economics*** 110, 321–352.

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

Bechky, B.A. (2003), "Object Lessons: Workplace Artifacts as Representations of Occupational Jurisdiction," ***American Journal of Sociology*** 109, 720–752.

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

Bewley, T. (2002), "Interviews as a Valid Empirical Tool in Economics," ***Journal of Socio-Economics*** 31, 343–353.

Bewley, T. (2007), "Report on an Ongoing Field Study of Pricing as It Relates to Menu Costs," manuscript.

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

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

Blanchard, O. and N. Kiyotaki (1987), "Monopolistic Competition and the Effects of Aggregate Demand," ***American Economic Review*** 77, 647–666.

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

Bonomo, M. and C. Carvalho (2004), "Endogenous Time-Dependent Rules and Inflation Inertia," ***Journal of Money, Credit and Banking*** 36, 1015–1041.

Caballero, R. (1989), "Time-Dependent Rules, Aggregate Stickiness and Information Externalities," Discussion Paper 428, Columbia University.

Caballero, R. and E. Engel (1991), "Dynamic (S, s) Economies," ***Econometrica*** 59, 1659–1686.

Caballero, R. and E. Engel (1993), "Heterogeneity and Output Fluctuations in a Dynamic Menu-Cost Economy," ***Review of Economic Studies*** 60, 95–119.

Campbell, J. and B. Eden (2007), "Rigid Prices: Evidence from the U.S. Scanner Data," Working Paper, Federal Reserve Bank of Chicago.

Caplin, A. (1993), "Individual Inertia and Aggregate Dynamics," in *Optimal Pricing, Inflation, and the Cost of Price Adjustment*, edited by E. Sheshinski and Y. Weiss

(Cambridge, MA: The MIT Press), pp. 19–45.
Caplin, A. and D. Spulber (1987), "Menu Costs and the Neutrality of Money," ***Quarterly Journal of Economics*** 102, 703–725.
Caplin, A. and J. Leahy (1991), "State Dependent Pricing and the Dynamics of Money and Output," ***Quarterly Journal of Economics*** 106, 683–708.
Caplin, A. and J. Leahy (1995), "The Economics of Adjustment." in *The Natural Rate of Unemployment*, edited by Rod Cross (NY: Cambridge University Press), pp. 77–89.
Carlton, D. (1986), "The Rigidity of Prices," ***American Economic Review*** 76, 637–58.
Carlton, D. (1989), "The Theory and the Facts of How Markets Clear: Is Industrial Organization Valuable for Understanding Macroeconomics?" in *Handbook of Industrial Organization, Vol. 1*, edited by R. Schmalensee and R. Willig, (Amsterdam: North Holland), pp. 909–946.
Carlton, D. and J. Perloff (2005), *Modern Industrial Organization*, *4th Edition* (New York, NY: Harper Collins).
Cecchetti, S. (1986), "The Frequency of Price Adjustment: A Study of the Newsstand Prices of Magazines," ***Journal of Econometrics*** 31, 255–274.
Cyert, R. and J. March (1963), *Behavioral Theory of the Firm* (Englewood Cliffs, NJ: Prentice Hall).
Danziger, L. (1999), "A Dynamic Economy with Costly Price Adjustments," ***American Economic Review*** 89, 878–901.
Danziger, L. (2007), "Adjustment Costs, Inventories and Output," manuscript, Ben-Gurion University.
Davis, M. and J. Hamilton (2004), "Why Are Prices Sticky? The Dynamics of Wholesale Gasoline Prices," ***Journal of Money, Credit and Banking*** 36, 17–37.
Dhyne, E., C. Fuss, H. Pesaran, and P. Sevestre (2007), "Lumpy Price Adjustment: a Microeconometric Analysis," working paper.
Dotsey, M. and R. King (2005), "Implications of State-Dependent Pricing for Dynamic Macroeconomic Modeling," ***Journal of Monetary Economics*** 52, 213–242.
Dotsey, M., R. King, and A. Wolman (1999), "State-Dependent Pricing and the General Equilibrium Dynamics of Money and Output," ***Quarterly Journal of Economics*** 114, 655–690.
Dutta, S., M. Zbaracki, and M. Bergen (2003), "Pricing Process as a Capability: a Resource-Based Perspective," ***Strategic Management Journal*** 24, 615–630.
Fabiani, S., et al. (2004), "The Pricing Behavior of Firms in the Euro Area: New Survey Evidence," Working Paper, European Central Bank-Inflation Persistence Network.
Fisher, T. and J. Konieczny (2000), "Synchronization of Price Changes by Multiproduct Firms: Evidence from Canadian Newspaper Prices," ***Economics Letters*** 68, 271–277.
Fisher, T. and J. Konieczny (2006), "Inflation and Costly Price Adjustment: A Study of Canadian Newspaper Prices," ***Journal of Money, Credit and Banking*** 38, 615–633.
Fligstein, N. (1996), "Markets as Politics: A Political-Cultural Approach to Market Institutions," ***American Sociological Review*** 61, 656–673.
Friedman, M. (1953), "The Methodology of Positive Economics," in *Essays in Positive Economics* (Chicago, IL: University of Chicago Press).
Galí, J. and M. Gertler (1999), "Inflation Dynamics: A Structural Econometric Analysis," ***Journal of Monetary Economics*** 44, 195–222.
Gordon, R. (1990), "What is New-Keynesian Economics?" ***Journal of Economic Literature*** 28, 1115–1171.
Hall, R. and C. Hitch (1939), "Price Theory and Business Behavior," ***Oxford Economic Papers*** 2, 12–45.

Hutchins, E. 1995. *Cognition in the Wild* (Cambridge, MA: The MIT Press).

Kashyap, A. (1995), "Sticky Prices: New Evidence from Retail Catalogues," ***Quarterly Journal of Economics*** 110, 245–274.

Klenow, P. and O. Kryvtsov (2005), "State-Dependent or Time-Dependent Pricing: Does It Matter for Recent U.S. Inflation?" manuscript.

Klenow, P. and J. Willis (2007), "Sticky Information and Sticky Prices," Working Paper, Federal Reserve Bank of Kansas City.

Konieczny, J. and A. Skrzypacz (2003), "A New Test of the Menu Cost Model," Manuscript, European Center for Advanced Research in Economic and Statistics, Universite Libre de Bruxelles, Bruxelles, Belgium.

Konieczny, J. and A. Skrzypacz (2004), "Search, Costly Price Adjustment and the Frequency of Price Changes: Theory and Evidence," Manuscript, Stanford University, Stanford, CA.

Konieczny, J. and A. Skrzypacz (2005), "Inflation and Price Setting: Evidence from a Natural Experiment," ***Journal of Monetary Economics*** 52, 621–632.

Krishna, A., C. Mela, and J. Urbany (2001), "Inertia in Pricing," Working Paper, University of Notre Dame.

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

Levy, D. (2007), "Price Rigidity and Flexibility: New Empirical Evidence, Introduction to the Special Issue," ***Managerial and Decision Economics***, forthcoming.

Machlup, F. (1946), "Marginal Analysis and Empirical Research," ***American Economic Review*** 36, 519–554.

Machlup, F. (1967), "Theories of the Firm: Marginalist, Behavioral, Managerial," ***American Economic Review*** 57, 1–33.

Mankiw, N.G. (1985), "Small Menu Costs and Large Business Cycles: A Macroeconomic Model of Monopoly" ***Quarterly Journal of Economics*** 100, 529–39.

Mankiw N.G. and R. Reis (2002), "Sticky Decisions versus Sticky Prices: A Proposal to Replace the New Keynesian Phillips Curve," ***Quarterly Journal of Economics*** 117, 1295–1328.

Mankiw, N.G. and D Romer (1991) *New Keynesian Economics, Volumes 1 and 2* (The MIT Press, Cambridge, MA).

McCallum, B. (1986), "On Real and Sticky-Price Theories of the Business Cycle," ***Journal of Money, Credit, and Banking*** 18, 397–414.

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

Nelson, R. and S. Winter (1982), *Evolutionary Theory of Economic Change* (Cambridge, MA: Harvard University Press).

Orlikowski, W. (2000), "Using Technology and Constituting Structures: A Practice Lens for Studying Technology in Organizations," ***Organizational Science*** 11, 404–428.

Prescott, E. (1987), "Comment [on Rotemberg (1987)]," ***NBER Macroeconomics Annual***, 110–114.

Rao, V. (1984), "Pricing Research in Marketing: the State of the Art," ***Journal of Business*** 57, S39–S60.

Ray, S., H. Chen, M. Bergen and D. Levy (2006), "Asymmetric Wholesale Pricing: Theory and Evidence," ***Marketing Science*** 25, 131–154.

Reis, R. (2006), "Inattentive Producers," ***Review of Economic Studies*** 73, 793–821.

Romer, D. (2001), *Advanced Macroeconomics, 2nd Edition* (Boston, MA: McGraw Hill).

Rotemberg, J. (1987), "The New Keynesian Microfoundations," ***NBER Macroeconomics***

Annual, 69–104.

Rotemberg, J. (2005), "Customer Anger at Price Increases, Changes in the Frequency of Price Adjustment and Monetary Policy" ***Journal of Monetary Economics*** 52, 829−52.

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

Sheshinski, E. and Y. Weiss (1977), "Inflation and Costs of Price Adjustment," ***Review of Economic Studies*** 44, 287–303.

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

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

Slade, M. (1996), "Sticky Prices in a Dynamic Oligopoly: An Investigation of (s, S) Thresholds," The University of British Columbia, Manuscript.

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

Spradley, J. (1979), ***The Ethnographic Interview*** (NY, NY: Harcourt Brace Jovanovich).

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

Woodford, M. (2003), "Imperfect Common Knowledge and the Effects of Monetary Policy," in Aghion, P., R. Frydman, J. Stiglitz, and M. Woodford (Eds.), *Knowledge, Information, and Expectations in Modern Macroeconomics*, In Honor of Edmund S. Phelps (Princeton, NJ: Princeton University Press), pp. 25−58.

Zbaracki, M., et al. (2004), "Managerial and Customer Costs of Price Adjustment: Direct Evidence from Industrial Markets," ***Review of Economics and Statistics*** 86, 514−33.

Zbaracki, M. and M. Bergen (2007), "Pricing Structure and Structuring Price," Working Paper, Wharton School, University of Pennsylvania.

Zbaracki, M., M. Bergen, and D. Levy (2007), "Pricing as an Organizational Problem: Evidence and Frameworks," Working Paper, University of Pennsylvania.

Table 1 – General Pricing Process

Two-Stage Process:

(1) List Prices Set (Marketing)

and

(2) Individual Bids Negotiated (Sales)

Some Issues Considered by Managers at Both Stages to Make the Pricing Decisions

Economic and Organizational Considerations When Adjusting Prices
Costs
Margins/Profitability
Price Sensitivity
Company Strategy/Goals
Value/Differentiation
Competition
Segmentation
Channel – End Customers
Channel - Distributors
Channel – Pass Through
Incentives
Status
Trust
Identity

Table 2. Organizational Consensus on the Economic Forces Driving a Price Reduction

Economic Variable	Marketing	Sales
Costs –lower	"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 – high	"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. The Marketing Rationale for the Price Cut

Considerations	The Marketing View
Costs	Decreased variable costs
Margins/Profitability	Increased for this product line, use aggregate data
Segmentation	Across product lines, use aggregate data
Channel - End Customers	Major focus: price reduction should target them
Channel - Distributors	
Channel - Pass Through	List price most effective tool
Price Sensitivity	High, greater for list price, use aggregate data
Competition	Price leadership, list price signals most effectively
Value/Differentiation	Low in the eyes of end customers
Company Strategy/Goals	Trying to achieve profitability and growth goals
Incentives	Saw distributors as having incentives to lower prices too far
Status/Power	Below upper management, above sales force
Trust	Don’t trust sales force to discount correctly
Identity	Pricing experts, able to handle aggregate data and financial analyses
Recommended Action	Cut list price

Table 4. The Sales Rationale for the Price Cut

Considerations	**The Sales View**
Costs	Decreased variable costs
Margins/Profitability	Helps improve bid profitability
Segmentation	Across distributors
Channel - End Customers	
Channel - Distributors	Major focus: discounts should be targeted to distributor circumstances
Channel - Pass Through	Discounts most effective tool
Price Sensitivity	High, greater for discounts, use bids as evidence
Competition	Bids at risk
Value/Differentiation	Low in the eyes of distributors
Company Strategy/Goals	Keep and grow business, bid profitability
Incentives	
Status/Power	Low within company, high with distributors
Trust	Don’t trust marketing to price correctly
Identity	Know the distributors well, wealth of experience and specific market information
Recommended Action	Increase discounts

Table 5. The Two Views Compared

Considerations	Marketing Rationale	Sales Rationale
Costs	Decreased variable costs	Decreased variable costs
Margins/Profitability	Increased for this product line, use aggregate data	Helps improve bid profitability
Segmentation	Across product lines, use aggregate data	Across distributors
Channel - End Customers	Major focus: price reduction should target them	
Channel - Distributors		Major focus: discounts should be targeted to distributor circumstances
Channel - Pass Through	List price most effective tool	Discounts most effective tool
Price Sensitivity	High, greater for list price, use aggregate data	High, greater for discounts, use bids as evidence
Competition	Price leadership, list price signals most effectively	Bids at risk
Value/Differentiation	Low in the eyes of end customers	Low in the eyes of distributors
Company Strategy/Goals	Trying to achieve profitability and growth goals	Keep and grow business, bid profitability
Incentives	Saw distributors as having incentives to lower prices too far	
Status/Power	Below upper management, above sales force	Low within company, high with distributors
Trust	Don't trust sales force to discount correctly	Don't trust marketing to price correctly
Identity	Pricing experts, able to handle aggregate data and financial analyses	Know the distributors well, wealth of experience and specific market information
Recommended Action	Cut list price	Increase discounts