

The Art of Price War: a Perspective from China

Z. John Zhang and Dongsheng Zhou¹

A price war is something to be avoided in the West. However, Chinese companies have earned a reputation for starting price wars. Many US companies know too well that the first sight of a Chinese company in a US market means a price war is coming: it always offers a price that is 30-50% lower than its closest competition (BusinessWeek 2004). By now, many US companies have a taste of that terrifying “China Price.” Many practitioners and experts question the rationality for Chinese companies to start price wars. “Why can't they just lower the price by 10% or even 20%,” many wonder aloud. “That way, they can still keep their damned price advantage and do much better for themselves, too?”

In the West, academic researchers and practitioners alike know that the outbreak of a price war means disastrous consequences for firms involved and hence they all view price wars in an industry as the failure of managerial rationality. A *Fortune* magazine article captures this prevailing view accurately. “What are price wars good for?” the article asks (Henderson, 1997). In the same breath, the author answers the question definitively: “Absolutely nothing.” If price wars are good for “absolutely nothing,” of course, no firm should ever initiate them. If a firm does, it must be driven by insanity. In

¹ Z. John Zhang is an Associate Professor of Marketing at the Wharton School in Philadelphia. Dongsheng Zhou is a Professor of Marketing at the China Europe International Business School (CEIBS) in Shanghai. We thank Eric Bradlow, Christophe van den Bulte, Raghu Iyengar, and Dave Reibstein for their helpful comments. We also want to thank the participants in the Wharton executive education program on pricing and the EMBA's at CEIBS for their enthusiastic participation in the discussion of price wars. For correspondence, please send email to zjzhang@wharton.upenn.edu or call at 215-898-1989.

that case, “[t]he best way to escape a damaging price war is *not* to jump into the fray at all” (Rao, Bergen, and Davis, 2000).

Chinese companies obviously do not share the same code of business conduct. They are not just “war mongers” in the US markets. They also take their gloves off in their own domestic markets and have no hesitation to start a price war if it is deemed necessary to achieve their sales and profit objectives. In the past ten years, firms in China have fought large-scale price wars in a wide range of industries, including consumer electronics, home appliances, personal computers, mobile phones, telecommunications, cables, and, most recently, automobiles. It is in their domestic markets where they hone their skills in waging price wars. Indeed, price wars are widely considered as a legitimate, effective marketing strategy by executives and business thought leaders in China. It is not uncommon for today’s executives to talk about the “business arena” as the “battleground,” and they do not just talk about it metaphorically, either. In fact, strategy in Chinese, “zhanlue,” literally means “battle plans” or “combat strategies.”

The rub is that while Western companies seem to suffer whenever they start, or they are caught in, a price war, Chinese companies seem to thrive on price wars they start and many emerge from them stronger, bigger, and more profitable. Like any other war, victories in price wars also produce many legendary “generals” in China. Some of them become idols for aspiring managers and some even become national heroes thanks to the extensive media coverage of price wars in China.²

² A keyword search of “price war” in one Chinese newspaper database, for instance, generated more than 13,000 articles in the past decade, some of which hail the initiators of price wars as courageous, decisive “generals.”

In 1995, for example, IBM, Compaq, and HP were the three best selling PC brands in China, but three years later, the top 5 PC brands in China were all locals who had fought their way up through price wars. In 1999, China's mobile phone market was dominated by Motorola, Nokia and other foreign brands with all the local brands together having less than 5% of the market. However, only four years later and after a series of intense price wars, the local brands took more than 50% of the market. Most recently in 2005, Chery, a local automobile company with only 10 years of history, launched several rounds of price wars and beat many global players to take the fourth place in terms of market share, and is now preparing for an aggressive assault on the US market in the coming years.

The sharp contrast in the attitudes toward price wars in China and in the West raises an intriguing question: are those Chinese companies simply lucky survivors in chaotic price wars, or do they know something about how to wage price wars that their Western counterparts do not? We will offer an answer to this question by taking a detailed look at two price wars that took place in China in the color TV industry and in the microwave oven industry during the mid-1990s. Our study has convinced us that luck has nothing to do with being a victor in a price war. Good planning and execution are the keys to winning. In other words, Chinese companies do seem to know something about price wars that the executives in the West do not or have forgotten.

No one should be surprised by the fact that firms in a country where executives routinely draw strategic inspirations from Sun Tzu's The Art of War may have a distinct perspective on price wars. What is somewhat surprising is the fact that we know very little of that Chinese perspective in the West. How do Chinese companies assess their

business environment to identify the opportunity for a price war? Apparently, they do not just randomly start a price war or start it everywhere. Then, the question is how do they decide whether and when to start a price war? Like in any other war, the forces unleashed in a price war can be very destructive and unpredictable and hence careful planning and execution are a necessity to stay in control of those forces. How do Chinese companies prepare for and execute such a war?

The answers to all these questions are critically important for the Western companies who do business in China or who compete with Chinese companies in the West. With many foreign companies counting on China's growth to drive sales and profitability, and with more and more Chinese firms entering global markets, frequent price wars in China and elsewhere seem inevitable. One must understand how Chinese companies use price wars as a strategic weapon to be able to see their coming, to fight price wars effectively, or even to avoid them altogether.

We offer answers to all those questions. We will first analyze two well-known price wars in some detail to see how Chinese executives make their decisions about starting a price war and how they plan for it. From these analyses, it is clear that Chinese executives *do* treat price wars as an opportunity, and that there are rational reasons for them. Indeed, putting all these reasons together, one begins to see a rational framework for initiating and planning for price wars and hence to appreciate "The Art of Price War." This framework helps us to address the question of whether a price war should be initiated, by what firm, in what industry, and under what structural conditions in the marketplace. This framework can be applied to Chinese markets to shed some light on why they are rife with price wars, and to markets in the West to explain why Chinese

companies are so aggressive with their prices and why Western companies are reluctant to start, or get involved in, price wars.

Anatomy of Two Price Wars

The Color TV Industry

In early 1996, China's color TV industry was highly fragmented, with more than 130 manufacturers. Each manufacturer had, on average, less than 120,000 units of sales. Only 12 had annual sales of over half a million units, and only 4 had annual sales of more than 1 million units. As a result, few manufacturers could take advantage of economies of scale and most of them operated inefficiently. However, they all slogged along because a vast majority of these companies were owned by local governments and they were protected in their local markets. Thus, there was very little room for any ambitious Chinese company to expand their sales and to achieve scale economies through market entry or mergers and acquisitions (M&A).

The upward mobility was also very limited for a Chinese company at the time. China's color TV market was a two-tier market. Foreign brands served the high-end market and enjoyed a 20 percent price premium over local brands. With that price premium, foreign brands, Japanese brands in particular, still held a dominant position in China, especially in the Chinese urban markets. Although the quality of domestic products was comparable to that of foreign brands, local brands were in general competing with each other in the low-end market, and import buyers would seldom consider local brands.

Thus, in this market environment, a Chinese TV manufacturer had little horizontal or vertical mobility to increase its sales. In fact, the breathing room for Chinese companies was quickly shrinking in late 1995. At the time, there was a good deal of smuggling of color TVs, which was a significant drag on the stability of TV prices. In addition, Chinese companies were under increasing downward pricing pressure from a number of sources. First, import tariffs were slated to go down in 1996 for small-screen color TV's from 60% to 50% and from 65% to 50% for large-screen color TV's. Second, lured by the sheer size of the China market, foreign investments in the Chinese TV industry were red-hot. All 10 of the largest TV manufacturers in the world at the time were rapidly expanding their production in China. It was estimated that in two years' time, if all the announced expansion plans were fully executed, they would add an additional 10 million units of annual capacity in the Chinese market. The sales of foreign brands were expected to cascade down at the expense of Chinese companies. In fact, one business plan prepared by a large global color TV manufacturer boldly suggested that in three years' time, by investing some \$3 billion in China, the company would destroy Changhong, the largest local competitor.

With 17 production lines concentrated in one place, Changhong ran the largest and most efficient color TV production in China. Its capacity at that time at least doubled that of the second largest Chinese manufacturer. Changhong was also the largest manufacturer for many key TV components, such as plastic injections, electronic components, remote controls, etc. As a highly vertically integrated company located in Sichuan, one of the less developed regions in China at the time, Changhong enjoyed cost advantages and earned the highest profit margin among all domestic color TV

manufacturers. The net profit margins for Changhong were around 20%, far ahead of most of its domestic rivals.

Despite being the strongest domestic TV manufacturer, Changhong had to worry about its long-term survival, and it had to find ways to increase its market share quickly to shore up its future. Changhong's CEO, Mr. Ni Runfeng, spent several months in late 1995 and early 1996 weighing alternative strategies to increase the company's market share. The top executives at the company, including the CEO, talked with a number of pricing experts, carried out a number of marketing surveys in various regions, and extensively analyzed the survey data. Through these interviews, surveys, and analyses, they collectively came to the conclusion that would startle any Western executive: a price war was the weapon of choice for Changhong to achieve a leadership position in the marketplace. They had their reasons.

On the one hand, a price war would put small, inefficient domestic TV manufacturers between a rock and a hard place: they could either cut their prices and suffer significant losses through margins, or maintain their high prices and suffer significant losses through volumes. In either case, they would have to struggle mightily to survive without any help from the local government. Such help was not forthcoming in early 1996 as readily as in earlier years, as the central government had tightened its fiscal policy, cascading down all the way to the local governments. Such help would become even less forthcoming if quick, costly, and significant damage could be inflicted to those local manufacturers. A decisive price war would do all that.

On the other hand, a significant price cut by a large local color TV manufacturer would also put foreign competitors, especially the Japanese TV manufacturers, in a

predicament. If they were to stay out of the fray, Changhong would gain at their expense. If they were to join the fray, they would leave a lot of more money on the table for their high-end customers without much increase in sales and hence significantly reduce their profitability. Moreover, low prices and mud wrestling with a Chinese manufacturer could, certainly in the minds of foreign manufacturers, only erode their brand equity and undermine their brand image. On top of all this, for any drastic pricing changes, they needed to get the approval from their foreign parent firms, which could be a lengthy process. For those reasons, Changhong did not expect any significant price cut by foreign manufacturers, at least not initially.

Thus, what Changhong counted on, by initiating a premeditated, determined price war, was a huge increase in sales volume, taking customers away from weaker domestic rivals and possibly from foreign rivals, too. Changhong's confidence in its ability to increase its sales was further enhanced by the fact that in early 1996, China's color TV industry was at a fast growth stage. With a significant drop in the prices for color TVs, the industry demand could expand significantly and Changhong could corner a significant chunk of that demand. Changhong was the first color TV manufacturer to be listed in China's stock market and it enjoyed a high level of brand awareness and a high-quality image among domestic brands.

Aside from its low cost position relative to other domestic manufacturers and its brand awareness and image, Changhong recognized a number of other advantages going for it once a price war broke out. In early 1996, Changhong had an inventory of around 1 million units with a total estimated value exceeding 2 billion RMB. Changhong's efficiency suffered because of the huge inventory. However, this ready supply of a large

quantity of color TV's provided the ammunition that Changhong would need in a price war to boost sales volumes. Changhong was also better prepared than any other domestic competitor to ramp up its production in case of surging demand. As the largest local color TV manufacturer, Changhong had built, over the years, a very close relationship with key component suppliers in the color TV industry. Once a price war got under way, Changhong could count on the reliable supplies of key components for its production. What also played to the advantage of Changhong as the initiator of a price war was the fact that smuggled color TV kinescopes, a key component for color TVs, were flooding the market in China and local component manufacturers had a large number of unsold color TV kinescopes in their inventory. According to one estimate, there were as many as 1.25 million units of inventory in 8 local kinescope manufacturers in early 1996. Changhong could tap a significant number of them to fight a price war.

With an uncertain future but ample ammunitions, Changhong thus found it an opportune time to stir up the industry with an unprecedented price war. After careful analyses, executives at Changhong decided that its price cut did not need to be a huge one for the price war to be effective. A 10% cut would enlarge its price differential with foreign brands to about 30% (before the price war, the price gap between local and foreign brands was around 20%) and put many domestic rivals in the red. The price cut was also affordable for Changhong given its 20% profit margin at that time. On March 26, 1996, Changhong fired the first shot, announcing a price reduction of 8% - 18% for all its 17"-29" color TVs, leading to price reductions ranging from RMB100 to RMB850.

The price war evolved mostly as Changhong had expected. All domestic TV manufacturers, especially the small ones, were shocked and angered by Changhong's

price reduction decision. However, they reacted with hesitation. Initially, most local players decided to stay out of the fray. The four biggest domestic players (Konka, Panda, SVA, and Peony) did not follow suit until June 6 when Konka announced a price cut of up to 20%. The main reasons for them to wait were threefold. First, they were caught by surprise and were not prepared for the price cut and were not sure how to respond. Second, many underestimated the possible impact of a price war because of the fragmented nature of Chinese TV market, with many different brands dominating in different regions. Third, some state-owned enterprises (SOEs), such as Panda and SVA, had high costs per unit and a thin profit margin to start with. An 8%-18% price cut was not affordable for them. Also, it did not help that Panda was getting ready for its IPO in Hong Kong in May 1996. Panda and Peony pinned their hope on government intervention to stop Changhong's "reckless" pricing behavior. The thought of government intervention could only dull their fighting spirit.

Some domestic manufacturers did react quickly to Changhong's price cut. TCL, a medium-sized TV manufacturer at that time, was the first to react. On April 1, it announced a price cut of 120 – 300 RMB. Xiahua, another medium-sized player, announced a price cut of 10%. Due to the capacity constraint and the shortage of key components, however, Changhong's rivals could cut prices for small-sized TVs only.

Foreign brands did not follow Changhong's price reduction, just as Changhong had expected. Sony and Panasonic, for instance, all decided to take the high road: they would focus on quality and functionality, not on price.

Changhong's decision to initiate an unprecedented price war generated a barrage of publicity throughout the country and had a very positive impact on its sales as

expected. A few months after the price war, Changhong's overall market share increased from 16.68% to 31.64%, with its share in the 25" market jumping from 20.76% to 45.25% and in the 29" market from 14.37% to 17.15% (in 1997, the overall share was further increased to 35%). Some medium-sized local players, TCL and Xiahua in particular, who followed suit quickly, had also benefited from the price war. They both increased their market share by more than 2%. In the meantime, small domestic players (sales less than 200k) in the market suffered mightily. During January – March 1996, there were a total of 59 local brands that had sales in the one hundred largest department stores in China. By April, this number dropped to 42. In the process, the market share for these small players dropped by 15.19%. Those big domestic manufacturers who did not follow suit saw their market shares dwindling, too. Panda's market share dropped from 7.6% to 5.8% and SVA from 5.5% to 2.6%.

Foreign brands also suffered. Before the price war, imports and joint venture products accounted for 64% of the market and local manufacturers for only 36%. After the price war, the market share of domestic products significantly increased with a total of around 60% by the end of 1996. The once all-powerful Japanese brands were all humbled and ended up with a much reduced market share. In 1997, 8 out of the top 10 best selling brands in China were Chinese and three local players, Changhong, Konka, and TCL became the best selling color TV brands in China, with their market shares at 35%, 15%, and 10% respectively. Only two foreign brands, Panasonic and Philips, made it to the top ten, each with about 5% of the market. Thus, the first ever large-scale price war in China drastically changed the landscape in the industry in favor of Chinese

companies and the CEO of Changhong, Ni Runfeng, became a hero for Chinese national industries.

The Microwave Oven Industry

While Changhong might still be considered as a lucky survivor of a risky price war where the chips happened to fall its way, Galanz, a microwave oven manufacturer, has to be considered as a recidivist “warmonger” who has thrived with a deliberate price war strategy. From August 1996 till October 2000, Galanz initiated five major price wars and, through them, became the world’s largest microwave oven manufacturer, with about 30% of the worldwide market and 76% of the Chinese market (see Table 1).

In 1995, China’s microwave oven industry was at its infancy and less than 2% Chinese urban households owned microwave ovens. To a Chinese household, a microwave oven was a luxury item and the total unit sales in that year were about 1 million. The profit margins were very high for manufacturers at the time (30%-40%). The high profit potential attracted many entrants in the industry and there were already 28 small domestic manufacturers throughout China. By 1996, that number was to become 116.

Table 1. Galanz’s Sales Information for Year 1995 – 2003

Year	Sales volume (in '000)	Local market share	Int'l market share
1995	200	25.1%	
1996	650	34.5%	
1997	2000	47.6%	
1998	4000	61.4%	15%
1999	6000	67.1%	20%
2000	10000	76.0%	30%
2001	12000	70.0%	35%
2002	13000	70.0%	40%
2003	16000	68.0%	44%

Galanz entered the microwave oven business in 1992 and by 1994 it produced 100,000 units of microwave ovens with a market share of about 10%. Soon afterwards in 1995, it achieved a market share of 25% and became a formidable competitor. It has done so by attracting talent from all over China, by purchasing an advanced production line from Japan, by devising effective marketing strategies (e.g., successfully entered the Shanghai market, the most important microwave oven market in China), and by responding to market changes very quickly.

Galanz's major competitor at the time was the Whirlpool-Xianhua (W-X), a joint venture formed in May 1995 between Whirlpool and the sizable Chinese manufacturer Xianhua, with Whirlpool owning the majority interest. In early 1996, Galanz and W-X each had about 25% of the market share in the microwave oven market, and they were far larger than the other competitors in China. However, relative to W-X, Galanz had a clear advantage: it was a more focused company with a streamlined, short decision-making process. At the time, Whirlpool was new to the Chinese market (it entered in late 1994) and was still learning the ropes of how to operate in China. It had four joint ventures in four different cities with four different Chinese partners in four different product categories (microwave ovens, air conditioners, refrigerators, and washing machines). Understandably, it encountered many problems in its China operations and could not pay sufficient attention to W-X. In addition, all key decisions in W-X had to be approved by Whirlpool's China head office, then its Asia Pacific office, and then by its U.S. headquarters. The whole process often took three months. Galanz, of course, took a note of that.

Galanz's decision to initiate the first price war in August 1996 was not an easy one. Senior executives at Galanz had long and heated debates on the risks and benefits of a price war and contemplated all scenarios. The majority of senior managers at the time opposed the price war strategy and preferred a safer strategy of maintaining the current high profit margins. In the end, the CEO made the call, siding with the minority, to get ready for war.

There were a number of reasons behind Galanz's decision, although the company was on a healthy growth trajectory. First, a significant portion of Chinese households were ready to modernize their kitchen with the purchase of a microwave oven, along with other appliances. A focus on high-end households and on high margins precluded riding that wave. Galanz estimated that significant price reductions would increase sales by about 100%.

Second, as one of the largest manufacturer in China, Galanz took upon itself the task to reorganize the industry for a sustainable future of growth. In an interview with one of the authors for this paper, Yu Yaochang, the VP of Galanz, recalled that one of the purposes of the first price war was to consolidate the industry by marginalizing small, inefficient players before they had a chance to grow and discourage new entrants. A high profit margin in the industry would both encourage excessive entry and hide inefficiencies going forward.

Third, perhaps, most importantly, a well-planned and executed price war could significantly benefit Galanz in terms of establishing its cost advantages in the marketplace. Galanz recognized that a significant price cut could substantially increase its sales through expanding the market as well as take customers away from weak

competitors. Then, a substantial increase in the company's sales could substantially reduce its unit cost through scale economies in production, distribution, and components sourcing, which in turn would make the price cut profitable in the first place. The trick here was to make sure that the cost decrease would outpace the price decrease so as to increase the company's profitability. Galanz believed that it had a chance to do this, as long as it was deliberate and meticulous in planning and executing the price war.

Two months before launching the price war, Galanz began to run its production lines on a 3-shift, 24-hours a day schedule, so that it had an ample supply to meet the expected surge in demand. In August 1996, Galanz launched its first price war with a price reduction of 40% on some of its key products and with an average price reduction of 20.1%. The size of the price cuts surely put customers as well as rivals on notice. In a number of cases, Galanz's price reduction levels on some products were higher than their current gross profit margins. Galanz picked August to start the price war, as it was the off-peak selling season when manufacturers would generally downscale their production and distribution.

The news of Galanz initiating a price war was reported widely in all major Chinese media. Retailers embraced the price war with open arms, as it could help them build store traffic and sell more of their other products. In many cases, they were even willing to take lower profit margins, 8% instead of the usual 20%, on Galanz products during the price war period. Competitors were caught unprepared and dazed. Most of the small manufacturers did not respond quickly, as they believed that Galanz was simply dumping its excess inventory in a low selling season. Galanz's main rival W-X was, as expected, particularly slow in responding to the price reduction.

The outcome of the first price war could not have been more positive for Galanz. By the end of 1996, Galanz's market share had increased from 25% to 34.5%. Before the price war, the gross profit margins for Galanz were close to 40%. After the price war, sales had increased by about 200% and the average unit cost was reduced by around 50%. Galanz's net profits also increased significantly. Even from the products where the magnitude of price cuts was bigger than that of profit margins, Galanz made profits because of cost reductions.

The huge success of the first price war had convinced the executives at Galanz that a deliberate price war strategy was a viable strategy, not only in the short term, but also in the long-run. From October 1997 to October 2000, Galanz initiated four more price wars and executed them with increasing sophistication. In each round of price wars, Galanz cut its prices substantially with double digit percentage point drops (up to 40% in some cases). The sales increases were also substantial, all around 100% - 200%. As a result, the company became more and more dominant as indicated in Table 1 by its ever rising market share. In each round of price wars, Galanz achieved an average unit cost reduction of about 30% - 40%. Because of those victories, in the Chinese media, Galanz became the ever-victorious army and its executives the ever-victorious generals.

The secrets behind the ever-victorious army were, of course, its cost advantages. To achieve the cost advantages, Galanz needed to drive up its volumes relentless. Pricing helped the firm to achieve high volumes. Ever since the first price war, Galanz adopted a simple and systematic way in setting its price to drive volumes. It set its price at the break-even level for its nearest competitor. For example, if the second player's annual sales were 2 million units, then Galanz would set its price at the break-even level for the

2-million units. During price wars, Galanz's price would even go significantly lower than this breakeven point. Using this strategy, Galanz always made rivals reluctant to cut prices and thus it always stayed ahead of competition in capturing more volumes. As the process unfolded, Galanz encountered fewer and fewer competitors. In 1996, there were about 120 microwave oven manufacturers. By 2003, the three largest microwave oven manufacturers took over 90% of the market.

The Art of Price War

The two examples of firms initiating and executing price wars successfully, of course, do not make price wars a smart marketing strategy. Indeed, there are incidents, even in China, where firms initiate price wars on impulse and bring ruin to themselves as well as to everyone else in their industry. What they do demonstrate, however, is the fact that price wars can be a potent, effective marketing strategy when they are deployed with forethought and skills and in the right circumstances. What constitutes right circumstances? How should a firm plan and execute a price war?

From the two examples discussed previously, we see that the Chinese executives did not start the price wars on impulse and they planned and executed the price wars with great care. Consciously or unconsciously, they were making rational calculations to make sure that they benefit from a price war and control its outcome. These calculations that they were making, it turns out, neatly fit into a simple framework with which the executives in the West are all too familiar but have not made the connection. Implicit in this framework is (almost) everything that an executive ever needs to know in order to plan, execute, and fight a price war. The Chinese executives in the two cases discussed

previously merely applied the framework, consciously or unconsciously. This framework is the so-called Incremental Breakeven Analysis (IBEA). With it, one can have a comprehensive, systemic understanding of the incentives facing firms in initiating and fighting a price war.

Incremental Breakeven Analysis (IBEA)

A price war always starts with a firm initiating a deep price cut in an industry, *e.g.* Changhong in the color TV industry and Galanz in the microwave oven industry. When the firm initiates such a price cut, by and large, it expects to benefit from it either right away or at some point in the future. Putting aside any long-term benefits or costs for now, the firm can only benefit in the short term if its sales go up sufficiently. To determine the threshold sales increase that is needed for a firm to benefit from a price cut, one can conduct the so-called incremental breakeven analysis. What this analysis does is to identify the sales change that will make a firm's profits after the price change to stay the same as before, or the breakeven sales change. In Figure 1, we display the formula for this threshold sales increase for a given price cut when a sales increase could lead to a change in a firm's marginal costs.

To use the formula, let's go back to the Galanz case. As we have discussed before, while planning for the first price war, Galanz was thinking of reducing its average product price by about 20%, or $\Delta p = 20\%$. To evaluate whether doing so could increase its contributions, Galanz could calculate the threshold sales increase it must generate with the 20% price cut to stay at breakeven. At the time, Galanz's average contribution margin---the contribution per unit sales before the price change (price minus marginal cost) as the percentage of the pre-change price, was about 40%, or $cm = 40\%$. The

company expected that the price cut would generate enough volume to reduce its unit cost by 30-40%, or on average $\Delta c = 35\%$. By plugging all these numbers in the formula, we have $\Delta q = 0.905$ or 90.5%. This suggests that if the demand for Galanz's products would increase by more than 90.5% as a result of the 20% price cut, Galanz would make more profit by implementing the price cut. Then, Galanz could focus on the question of whether it was possible to generate that much sales increase given the market environment it found itself. At the time, Galanz expected its sales to increase by 100%, fully anticipating competitors' reactions (the actual sales increase was about 200%). Therefore, initiating the price war was the rational thing to do.

$$\Delta q = \frac{\Delta p - (1 - cm)\Delta c}{cm - \Delta p + (1 - cm)\Delta c}$$

Definitions:

Δq ---the breakeven sales increase in percentage;

Δp ---the magnitude of a price cut;

cm ---the contribution margin in percentage (before the price cut);

Δc ---the reduction in marginal costs in percentage due to the price cut.

Figure 1: Incremental Breakeven Analysis

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The value of IBEA goes far beyond that simple calculation, of course. Some rigorous analyses of that formula will help us to understand the incentives facing a firm

in initiating a price war. By analyzing those incentives, we can begin to understand how the Chinese executives in the previously discussed two cases planned and executed price wars.

From the IBEA, we can see that it is more tempting for a firm to initiate a price war if it faces a small Δq , all else being equal. In other words, if it does not take much sales increase for a firm to benefit from a deep price cut, the firm should have more an incentive to use price as a weapon and to initiate a price war. This means that we can analyze the formula in Figure 1 to see when Δq is small to know where a price war is more likely to break out and what kind of firms may have the most incentive to initiate it.

To start, we note in the formula that if cm is larger, Δq is smaller. This means that if the current profit margin is high, it does not take much in increased sales for a firm to benefit from a price cut, and thus there should be more of a temptation for such a firm to engage in price competition. This analysis suggests two insights. First, across different industries, the ones that have (unusually) high margins tend to be the ones where price wars break out, all else being equal. Indeed, in China, price wars do not break out randomly across different industries. When the first price war broke out in the color TV industry in China, it was a high profit margin industry that had supported a large number of manufacturers, however inefficient they were. When the first price war broke out in the microwave oven industry, that industry was also characterized by high profit margins and excessive entry. Indeed, all subsequent price wars in China happened in high margin industries such as consumer electronics, home appliances, personal computers, mobile phones, telecommunications, cable TV, and, automobiles. Second, within the same industry, the firm that has the best margin, typically due to a lower cost, has more of an

incentive to initiate a price war. Changhong was such a firm, Galanz was such a firm, and so were many other price war initiators in China.

Based on these two insights, we can also understand why Chinese companies tend to start price wars when they enter the markets in the West. Chinese companies have cost advantages and a favorable exchange rate, and they encounter a small number of competing firms in every market they enter. To them, every business in the West is a high margin business!

We also note that as Δc in the formula increases, Δq is always smaller. This means that in industries where significant scale economies were involved, price wars are more likely to break out. In those industries, firms face significant incentives to ramp up their sales and to stay ahead of competition in going down the cost curve. All those industries in China that have been plagued by price wars are the ones where significant scale economies exist. Indeed, even in the West, price wars periodically flare up in industries with significant scale economies such as for PCs, electronics, and airlines. Furthermore, the fact that Δc decreases Δq also suggests that within an industry, the firm that is most skillful in taking advantage of scale economies is more likely to be the one that initiates a price war and benefits from it, all else being equal. Both Changhong and Galanz were such firms that consciously and skillfully exploited scale economies to their own benefit.

Interestingly, when a firm enters a new market starting with a clean slate, it typically does have lots of scale economies to exploit. This is because studying the market, setting up distribution channels, and advertising all take significant fixed costs.

In this sense, the aggressive pricing behavior on the part of Chinese companies to carve a slice of market share when they enter into the markets in the West is rather expected.

Finally, in the formula, a larger Δp will lead to a larger Δq . On the surface, this relationship merely suggests that a large price cut needs to generate a larger volume increase to breakeven. However, upon reflection, this relationship also tells us something about how price wars are related to product differentiation. In a highly differentiated industry, it would take a huge price cut to persuade customers to switch from one firm to another. This, in turn, means that a huge increase in sales has to be expected in order to justify the price cut in the first place. Therefore, in a differentiated industry, price wars are less likely to break out. It is almost unnecessary to repeat the cliché here, except the fact that it conforms with the Chinese experience with price wars very well. Price wars almost always break out in an industry in China when products in the industry become standardized, with little room for further technology innovations and quality improvements. In addition, the fact that the foreign brands charged a 20% premium and it only took about 10% price cut to draw customers away from foreign brands had certainly helped Changhong to make up its mind to start the price war.

The preceding analyses answer the questions of what kinds of firms in what kinds of industries would have the most incentive to start a price war and benefit from it. However, they do not answer the question of how to plan and execute a price war. For that answer, we need to look deeper into Δq . To benefit from a deep price cut, a firm must generate enough sales increase to cross the threshold of Δq . Where does this sales increase come from?

From a firm's perspective, its sales q comes from the demand in the industry Q and its market share s , *i.e.* $q = sQ$. Thus, its sales change will come from either its market share change, or the industry demand change, or both. In fact, some algebra will show $\Delta q = \Delta s + \Delta Q + \Delta s \Delta Q$, where Δs is the change in the firm's market share in percentages and ΔQ is the change in the industry demand in percentages. What this means is that a firm can cross the threshold sales increase either through a significant market share increase or through a significant increase in the industry demand (or both of course). We now take up each source of sales increase in turn to see how a firm could maximally tap each source.

To benefit from a price war, a firm can try to increase its market share Δs so that it can generate enough sales increase to cross the threshold Δq . For instance, if $\Delta q = 20\%$, a firm can cross the threshold if its market share increases by more than 20%, or $\Delta s > 20\%$, even if the industry demand does not change, or $\Delta Q = 0$. Therefore, while planning and executing a price war, a firm should give itself the maximal chance to increase its market share. There are a number of things that a firm can consider here.

First, to the extent that it is easier for a firm with a small initial market share to increase it, a small market share firm is better positioned to use price as a weapon and to initiate a price war, and a big market share firm may want to think twice about it. For that reason, we rarely see firms with a dominant market share starting a price war. Second, the timing of starting a price war is very critical. A firm has a better chance to increase its market share if competition is unable or unwilling to react swiftly. A clumsy, half-hearted response from competition would give the war-initiating firm the time and space to stuff distribution channels and to occupy new sales territories. Both Changhong

and Galanz, as discussed before, have thought hard about competitive reactions and about an opportune time to fire the first shot.

Third, even if competition reacts swiftly by bringing down their own prices, an astute firm can still increase its market share if it has prepared for a price war adequately. As competing firms lower their prices, the firms that will gain in market share will be the ones that have products on hand to sell. A firm that has prepared for a price war, through building up its inventories, ramping up its productions, and boosting up its production capabilities, will be best positioned to increase its market share. From the discussion before, we see that both Changhong and Galanz had made elaborate preparations in those activities before they fired their first shot, while competition was caught napping. Of course, competitor could have seen that ramp-up and acted accordingly.

Fourth, a firm can gain a larger market share when less cost-effective firms in an industry are weeded out. A price war will put strains on all firms in an industry. However, less efficient firms will buckle first and surviving firms will fatten their market shares. Clearly, in both cases that we have discussed in this paper, the Chinese companies made explicit calculations to consolidate their respective industry and achieved that objective. In fact, looking more broadly, this motivation has surfaced again and again in many other Chinese industries where price wars break out. Indeed, an industry with a large number of firms and a wide distribution of sizes and operating efficiencies is a fertile ground for price wars. As China has many of those industries, while in the West there are few, it is not surprising that there are more price wars in China than in the West and Chinese executives may seem to be feistier.

Through many price wars, Chinese executives have also learned that to weed out cost-inefficient firms in a market, they do not necessarily need to fight a prolonged, bloody fight. A “shock and awe” strategy can quickly convince an inefficient rival to get out of the way, as any resistance is either futile or fatal. Both Changhong and Galanz thought of this in planning and executing their price wars. From this perspective, it is perhaps understandable that Chinese companies are gung-ho about charging a price 30%-50% lower than competition, rather than a gentlemanly 10% or 20% lower, when they invade a market in the West.

Of course, not all bets are off if a firm cannot increase its market share by starting a price war. Another important factor in a firm’s price war calculus is ΔQ , the change in the industry demand. When a price war breaks out, even if all competing firms in the market are equally efficient and they all follow suit cutting their prices so that no firm can gain any additional market share, firms can still benefit from price wars if they expand the industry demand sufficiently. In the West, people tend to forget the times when the markets for mundane products such as microwave ovens, color TV’s, refrigerators, etc., were growing at a fast pace and the total demand for them was price elastic. However, in China, they are all high growth industries with high price elasticity and hence substantially lower prices can open the floodgate for consumer purchases. This is also one of the key reasons why there are so many price wars in China but not in the West. Changhong was betting on this surge in the industry demand and so was Galanz. What this also means is that as the growth of an industry levels off, one should begin to observe fewer price wars and more focus on non-price competition.

Conclusions

We hope that our discussions so far, based on the experience of Chinese companies have achieved two objectives. First, they demystify rampant price wars in China and combative pricing behavior on the part of Chinese companies. There is nothing intrinsically Chinese, as far as we can detect, about the calculus that the Chinese executives use in planning and executing price wars. What is intrinsically Chinese, however, is the fact that a whole generation of Chinese executives have grown up in a business environment characterized by growing markets, heterogeneous firms with a wide distribution of cost-efficiencies, and new technologies with significant scale economies. This business environment provides many profitable opportunities for them to engage in price wars and to hone their skills, whereas in Western markets, oligopolistic competition among (mostly) equals in mature markets encourages more finesse in devising marketing strategies. In both cases, firms are weighing the same factors, albeit making different strategic choices in the end.

Second, price wars are not *per se* a nonstarter as a marketing strategy, and the stigma associated with them in the West is not helpful for executives who have to fight in the trenches. As with any other business strategy, the usefulness of price wars depends on the circumstances. A company can take a quite rational approach to plan and execute a price war when opportunities arise. Chinese companies seem to have a knack in identifying those opportunities and seizing upon them. However, one need not look far to discover the art of price war, and the familiar incremental breakeven analysis or IBEA provides one with a guide for planning and executing a price war.

Up to this point, we have purposefully left two issues untouched. First, price wars have long-term consequences beyond what the short-term payoffs capture. How could IBEA be adjusted to incorporate these long-term effects? Second, the art of a price war is all about how to plan and execute a price war and it seemingly says little about a firm at the receiving end. If a Chinese company comes to a US market, how could a US company prevent it from starting a price war? If it cannot discourage the Chinese company from charging a price 30-50% lower, what should it do?

The first question is easier to answer. If you can assess specific long-term benefits or losses from a price war in terms of its impact on the future cash flows, you can always adjust Δq downward or upward accordingly. Thus, for instance, if Philip Morris expected that a 20% price cut on the Marlboro Friday (April 2, 1993) would have had the long-term effect of disciplining generic brands and thus stabilizing price competition in the future, it should have been willing to accept a much lower immediate sales lift, sacrificing short-term profits for the long-term gains.

The questions related to defensive strategies are harder to answer. Depending on the situation in which a firm finds itself, the answers can be quite different. We are currently developing detailed answers to those two questions, based on specific case studies. However, one already gets all the clues to those answers from IBEA if one thinks like a contrarian. IBEA suggests two broad principles for fighting a price war.

First, as Sun-Tzu put it best in his Art of War, “the highest realization of warfare is to attack the enemy’s plans” so that one can subjugate “the enemy’s army without fighting.” Specific to fighting a price war, what this means is that you want to do things that can prevent any company from starting and benefiting from a price war. In the

parlance of incremental breakeven analysis, you want to increase Δq facing your rivals, so much so that they never have a chance to increase their sales significantly to cross that threshold.

Second, when a price war has to be fought, you cannot fight it by merely taking a defensive posture. Once again, Sun-Tzu put it best, “One who cannot be victorious assumes a defensive posture; one who can be victorious attacks.” In the parlance of IBEA, you want to do things that can put your own company in the position to capitalize on a rising industry demand (ΔQ) and on the possible redistribution of market shares (Δs) in the industry.