
THE CHINESE FIREWORKS INDUSTRY

Ruihua Jiang wrote this case under the supervision of Professor Paul W. Beamish solely to provide material for class discussion. The authors do not intend to illustrate either effective or ineffective handling of a managerial situation. The authors may have disguised certain names and other identifying information to protect confidentiality.

This publication may not be transmitted, photocopied, digitized or otherwise reproduced in any form or by any means without the permission of the copyright holder. Reproduction of this material is not covered under authorization by any reproduction rights organization. To order copies or request permission to reproduce materials, contact Ivey Publishing, Ivey Business School, Western University, London, Ontario, Canada, N6G 0N1; (t) 519.661.3208; (e) cases@ivey.ca; www.iveycases.com.

Copyright © 2011, Richard Ivey School of Business Foundation

Version: 2017-05-04

In February 2009, Jerry Yu was spending the Chinese New Year holidays in Liuyang (lee-ou-yang), a city known as “the home of firecrackers and fireworks,” located in Hunan Province in China. Jerry was an ABC (America-Born Chinese). With an MBA, he was running a small family-owned chain of gift stores in Brooklyn, New York. Liuyang was his mother’s hometown. During his visit, his relatives invited him to invest in a fireworks factory that was owned by a village. Mr. Yu had been impressed by the extravagant fireworks shows he had seen during the festival; however, he wanted to assess how attractive the Chinese fireworks industry was before he even looked at the financial details of the factory.

HISTORY OF FIREWORKS AND FIRECRACKERS

Fireworks referred to any devices designed to produce visual or audible effects through combustion or explosion. The art of making fireworks was formally known as pyrotechnics. Firecrackers were a specific kind of fireworks, usually in the form of a noisemaking cylinder. Firecrackers were often strung together and fused consecutively, a staple of Chinese New Year celebrations, weddings, grand openings, births, deaths and other ceremonial occasions.

The main ingredients of fireworks had remained almost the same over the past thousand years: 75 parts-by-weight potassium nitrate, 15 parts charcoal and 10 parts sulfur. It burned briskly when lighted, but did not erupt or make any noise. When it was found that a projectile could be thrust out of a barrel by keeping the powder at one end and igniting it, black powder became known as gunpowder. Today, smokeless powder has replaced black powder as the propellant in modern weaponry, but black powder remains a main ingredient in fireworks, both as a propellant and as a bursting charge.

It was generally believed that the Chinese were the first makers of fireworks. The Chinese made war rockets and explosives as early as the sixth century. One legend said that a Chinese cook, while toiling in a field kitchen, happened to mix together sulfur, charcoal and saltpetre, and noticed that the pile burned with a combustible force when ignited. He further discovered that when these ingredients were enclosed in a length of bamboo sealed at both ends, it would explode rather than burn, producing a loud crack. This was the origin of firecrackers. In fact, the Chinese word for firecrackers — *bao-zhu* — literally means “exploded bamboo.”

The loud reports and burning fires of firecrackers and fireworks were found to be perfect for frightening off evil spirits and celebrating good news at various occasions. For more than a thousand years, the Chinese had been seeing off past years and welcoming in new ones by firing firecrackers.

Fireworks made their way first to Arabia in the seventh century, then to Europe sometime in the middle of the 13th century. By the 15th century, fireworks were widely used for religious festivals and public entertainment. Most of the early pyrotechnicians in Europe were Italians. Even today, the best-known names in the European and American fireworks industry were Italian in origin. From the 16th to the 18th century, Italy and Germany were the two best-known areas in the European continent for fireworks displays.

In 1777, the United States used fireworks in its first Independence Day celebration, and fireworks have become closely associated with July Fourth celebrations ever since.

Up until the 1830s, the colors of the early fireworks were limited, but by 2009, there were six basic colors used in fireworks.

LIUYANG — THE HOMETOWN OF FIRECRACKERS AND FIREWORKS

According to historical records in China, firecrackers and fireworks “emerged during the Tang dynasty (618-907 AD), flourished during the Song Dynasty (960-1279 AD), and originated in Liuyang.” For more than 1,000 years, Liuyang had been known as the “hometown of firecrackers and fireworks of China,” a title that was officially conferred to Liuyang by the State Council of China in 1995. As early as 1723, Liuyang fireworks were chosen as official tributes to the imperial family and were sold all over the country. Exports started early: by 1875, firecrackers and fireworks were being shipped to Japan, Korea, India, Iran, Russia, Australia, England, the U.S., and other countries. In China, the name Liuyang had become almost synonymous with firecrackers and fireworks. Liuyang-made firecrackers and fireworks won numerous awards over its long history of fireworks making.

The long history and tradition had made fireworks more than just a livelihood for the Liuyang people. Almost every native person in the area knew something about fireworks making, or had actually made firecrackers or fireworks in their lifetime. As a result, Liuyang claimed an impressive pool of skilled labor. Firecrackers and fireworks had become the pillar industry of Liuyang, accounting for nearly 50 per cent of all jobs or about one-third of the total population in the Liuyang District (including Liuyang City and the surrounding counties). In 2008, Liuyang claimed 2,702 fireworks manufacturers with an additional 2,144 in the surrounding area. In total, there were 6,458 fireworks producers in China. While there has been some trend towards consolidation in the industry, most factories were still owned either by villages or families. Among them, about a dozen or so were medium to large factories with employment between 100 to 500 workers. The rest were small workshops employing anywhere from 10 to 50 people, depending on market demand.

Liuyang was the top fireworks exporter in the world, making up 60 per cent of global production. The trademarked brand “Red Lantern” had become well-known to fireworks lovers around the world. China now accounted for 89 per cent of worldwide fireworks exports with the vast majority of that coming from Liuyang. In addition, over the past ten years, China had become the largest market for fireworks. The ratio of domestic use to exports was 6:4, and Chinese imports of fireworks were negligible.

The increase in demand in the Chinese market had only intensified the competition. All new demand was more than met by the Chinese fireworks industry. Thus, instead of seeing increased margins, the profit margins for many small manufacturers had shrunk over the past decade. In order to make up the difference, manufacturers were cutting corners. However, some of these cost cutting efforts came at the expense of safety. A 2007 factory explosion that left 11 workers dead was blamed primarily on decreased safety standards, which were blamed on a lack of money due to cut throat competition. In response, the government and company officials from Luyang and surrounding areas agreed to regulate the price of fireworks with the hope of increasing profit margins. With higher profit margins, company officials vowed to increase workers safety.

The Product

Fireworks could be classified into two categories: display fireworks and consumer fireworks. The display fireworks, such as aerial shells, maroons, and large Roman candles, were meant for professional (usually licensed) pyrotechnicians to fire during large public display shows. They were devices that were designed to produce certain visual or audio effect at a greater height above the ground than the consumer fireworks, which the general public could purchase in convenience stores and enjoy in their own backyards. Display fireworks were known as Explosives 1.3 (Class B prior to 1991) in the U.S. The consumer fireworks belonged to Explosives 1.4 (Class C prior to 1991). The difference lay mainly in the amount of explosive components contained in the product. Canada had a similar classification system. In the U.K., it was more carefully divided into four categories: indoor fireworks; garden fireworks; display fireworks; and display fireworks for professionals only.

There were many varieties of fireworks. Liuyang made 13 different types with more than 3,000 varieties. The major types included fountains, rockets, hand-held novelties, nail and hanging wheels, ground-spinning novelties, jumping novelties, floral shells, parachutes and firecrackers.

Historically, firecrackers made up 90 per cent of the total production and sales. Over the past 50 years or so, however, there had been a shift away from firecrackers to fireworks. In 2009, firecrackers made up less than 20 per cent of the total sales. The skill levels of fireworks-making had been greatly improved. For instance, the old-day fireworks could reach no more than 20 metres into the sky, while the new ones could go as high as 400 metres.

Not much had changed in fireworks-making. Over the last few decades, numerous novelties were added to the fireworks family. However, innovation had never reached beyond product variations. The ingredients had remained more or less the same. The process technology had not changed much either, although some manual processes, such as cutting the paper, rolling the cylinders, mixing powder, and stringing the cylinders could now be done by machines.

Safety Issues

The fact that fireworks were made with gunpowder and listed under explosives brought about the issue of safety. Numerous accidents related with fireworks had resulted in tragic human injuries and considerable property damages. As a result, fireworks had become heavily regulated in most countries.

According to the manufacturers, fireworks were the most dangerous during the production process. Powder mixing and powder filling, in turn, were the two most dangerous procedures. The workers had to abide by strict safety measures. Even a tiny spark caused by the dropping of a tool on the floor or the dragging of a chair could start a major explosion. The quality of the ingredients was also of significant importance. Impure ingredients could greatly increase the possibility of accidents. In Liuyang, almost every year, there would be one or more accidents that resulted in deaths and damages. With an ever increasing number of firms entering the industry, safety was an ongoing concern.

Once the fireworks were made, they were relatively safe to transport and store. Even in firing, good quality fireworks rarely caused any problems if everything was done properly. Most of the fireworks-related accidents occurred during private parties or street displays, and quite often involved children playing with fireworks that needed to be handled by adults, or adults firing shells that required professional expertise. Most accidents were linked to consumer backyard events rather than to public displays.

According to the United States Consumer Products Safety Commission's (CPSC) data, injuries related to fireworks had declined substantially, even though their use had increased (see Exhibit 2). For 2009, there were an estimated 5,244 fireworks-related injuries, 30 per cent of which were caused by firecrackers and bottle rockets. Of all the injuries related to firecrackers and fireworks, most were treated in the emergency department. Eight per cent of patients had to be admitted to hospital, and seven people died due to sustained injuries.

Children from ages five to 14 were the most frequently involved in fireworks-related injuries. However, fireworks were not the only consumer product that might cause injuries to this age group. According to a 2008 CPSC Injury Surveillance Report, fireworks were actually safer than swing sets and baseballs. However, fireworks-related injuries were usually the most dramatic and the most widely publicized accidents, which partly explained the fact that fireworks was the only category among the products listed in Exhibit 3, for which prohibition, instead of education and adult supervision, was often urged.

In the United States, multiple government agencies were involved in regulating fireworks. The Bureau of Alcohol Tobacco and Firearms (BATF) controlled the manufacture, storage, sales and distribution of explosives, i.e., Class B fireworks. The CPSC regulated Class C consumer fireworks, and the Department of Transportation dealt with the transportation of fireworks. Although at the federal level, fireworks and firecrackers were allowed as long as the safety features were up to the standard, local governments would have their own different regulations regarding fireworks consumption. Out of the 50 states, one would allow only novelty fireworks, five had banned all consumer fireworks but allowed professional pyrotechnics, and four allowed customers only wire or wood stick sparklers and other novelty items. However, the remaining 40 would allow essentially all consumer fireworks. For display fireworks, permits would have to be obtained from federal and local authorities and fire departments.

All legal consumer fireworks offered for sale in the United States had been tested for stability by the Bureau of Explosives and approved for transportation by the U.S. Department of Transportation. Because of the limited amount of pyrotechnic composition permitted in each individual unit, consumer fireworks would not ignite spontaneously during storage, nor would they mass-explode during a fire. Therefore, no special storage was required.

In most of Europe, similar regulations were in place for safety considerations, only the requirements were regarded as less stringent. In Canada, however, regulations were extremely restrictive. However, over the past decade, Chinese fireworks companies had made great strides in the Canadian market. In 1999, there

were no Chinese companies allowed to sell fireworks in Canada. By 2009, over 75% of all fireworks imports to Canada were from China.

THE FIRECRACKERS AND FIREWORKS INDUSTRY IN CHINA

The firecrackers and fireworks industry in China was dominated by small family-owned-and-operated workshops. It was essentially a low-tech, highly labor-intensive industry. After 1949, government-run factories replaced the family-owned workshops. The increased scale and government funds made possible the automation of some processes. However, the key processes, like installing powder, mixing color ingredients, and putting in fuses, were still manually done by skilled workers.

The factories themselves were made up of small workshops that stood away from each other, so that in case of an accident, the whole factory would not explode. For the same safety consideration, the workshops were usually located near a water source and in sparsely populated rural areas, to reduce the noise and explosion hazard.

After the reform towards a market economy started in 1979, most of the factories were broken up and became family-run units of production again. It was hoped that this privatization might help to motivate people to increase their productivity and raise output. However, this move also served to restrict further technological innovations. There were hardly any research and development (R&D) facilities, nor human and capital resources allocated to R&D in most fireworks companies. The few resources that were available were all spent on product varieties. Even in Liuyang, out of the 400,000 or so people working in the industry, very few were engineers with advanced professional training.

In response, the Hunan and other local governments began initiatives aimed at upgrading the traditional fireworks industry. Substantial amounts of money were spent on R&D. The Liuyang Firecrackers and Fireworks Authority reported that they had spent RMB 2,000 million in projects with the Beijing University of Technology and the Nanjing University of Science. Among these initiatives were environmentally friendly fireworks, which used cold flame fireworks technology.

The majority of the manufacturing workers were regular farmers who had learned how to make fireworks just by watching and following their elders. They would come to work in fireworks workshops when there were jobs to be done, and return to till their fields if there were none. In Liuyang, for instance, few factories operated year-round. Most workshops would operate as orders came in. Since the fireworks-making communities were very concentrated geographically and had lasted for generations, only a few places (like Liuyang) could claim a large pool of skilled fireworks-makers.

Although Liuyang was by far the most well-known place for making fireworks in China, it faced increasing competition within the country. Also located in Hunan Province, Liling was another major manufacturing community of fireworks. Liling fireworks did not enjoy the same reputation and variety as Liuyang products, but they were fierce in price competition. In the neighboring Jiangxi Province, Pingxiang and Wanzai fireworks had become strong competitors both in price and quality, especially on the low- and medium-priced market. In the high-end product market, especially in large-type display fireworks and export market, Dongguan in Guangdong Province had taken advantage of its closeness to Hong Kong and more sophisticated management and marketing practices, and snatched market share from Liuyang. By 2009, however, more than one third of all firms and 60 per cent of Chinese production remained in Liuyang.

The initial capital requirement for starting a fireworks-manufacturing facility was relatively low. To set up a factory with the necessary equipment for making large display shells would require around RMB1,250,000.¹ However, setting up a small family workshop making consumer firecrackers and fireworks would require less than RMB125,000. Consequently, the number of small manufacturers mushroomed after the government started to encourage private business ventures.

While labor costs in the area were still low, they were steadily increasing. As a result of Chinese economic growth, wages had almost doubled over the past five years. This was in part because many workers were moving into less dangerous occupations. Skilled workers engaged in major processes would earn an average of RMB1,200 to RMB1,800 per month. A non-skilled worker would be paid only RMB500 to RMB700 every month. In larger factories, labor costs were between 20 and 30 per cent of total costs.

The main raw materials for fireworks were gunpowder, color ingredients, paper, fuse and clay soil. None would be difficult to procure. However, because of the growth in the Chinese domestic fireworks market, costs of raw materials were steadily rising. Another possible problem in supply was quality. Major manufacturers would usually establish long-term relationships with their suppliers to guarantee the quality of the materials. The small workshops would often go with the lowest prices, sometimes at the cost of quality, which could lead to fatal results.

The number of small companies intensified competition. The private workshops were flexible and quick in responding to market demand. They did not entail much administrative cost. Compared to government-owned or some collectively-owned factories, they did incur the costs of providing health care, retirement benefits and housing. They usually did not do any product research or design. Oblivious to intellectual property protection, they would copy any popular product design and sell it for much less. The resulting price drop had become a serious problem for the whole industry. As the profit margin kept shrinking, some workshops would hire cheap unskilled workers, and use cheap equipment and raw materials to cut down on cost. The results could be disastrous.

THE DOMESTIC MARKET

Firecrackers and fireworks had long been an integral part of any ceremonies held in China. Until recently, demand had been stable, but had risen in the past three decades because of increased economic development and living standards. Economically, market reform and unprecedented growth had given rise to the daily appearance of multitudes of new companies and new stores. As people's income level and living standards kept rising, fancier and pricier fireworks and firecrackers were desired over the cheap simple firecrackers, thereby creating more profit opportunities for fireworks manufacturers. Almost every household would spend at least a couple of hundred RMB on firecrackers and fireworks during the Spring Festival.

However, during the 1990s, increased concerns over environmental pollution and safety of human life and property led more and more cities to regulate the consumption of fireworks and firecrackers. Every year, high profile fireworks-related accidents were reported and emphasized on mass media before and after the traditional Spring Festival. Some articles even condemned firecrackers and fireworks as an old, uncivilized convention that created only noise, pollution and accidents. In a wave of regulations, city after city passed administrative laws regarding the use of fireworks. By 1998, one-third of the cities in China had completely banned the use of firecrackers and fireworks. Another one-third only allowed fireworks in designated places. This led to a decline in domestic market demand.

¹ In 2009, the exchange rate was around 6.60 yuan per US\$1.00.

However, all this began to change in the mid 2000s. Demand began to soar when Beijing lifted a 12-year ban on fireworks in 2005. Other cities followed suit. In 2005, 106 cities eased restrictions on fireworks; in 2006 another 54 cities eased restrictions. This was followed by 40 cities in 2007 and another 79 cities in 2009. All this led to an explosion in the Chinese domestic fireworks market.

In the meantime, domestic competition grew intensely. The reform towards a market economy made it possible for numerous family-run workshops to appear. They competed mainly on price. Almost every province had some fireworks-making workshops or factories, many set up and run with the help of skilled workers who had migrated from Liuyang. These small establishments usually were located in rural, underdeveloped areas where labor cost was low. The manufacturing was done manually, sometimes without safety measures, using cheap raw materials and simplified techniques. The products were sold locally at low prices, making it difficult for Liuyang fireworks to sell in those areas. To make things worse, these products would often copy any new or popular product designs coming out of Liuyang or other traditional fireworks communities, even using their very brand names.

In the past, fireworks were sold through the government-run general merchandise companies. Eventually, private dealers took over a large part of the business. Overall, the distribution system was rather fragmented. The old government-run channels were not very effective, especially for general merchandise. In the new distribution channels, wholesale dealers would get shipments directly from the manufacturers, and then resell to street peddlers and convenience stores.

In the countryside, wholesale markets would appear in focal townships, with wholesale dealers and agents of the manufacturers setting up booths promoting their products. Small peddlers in the surrounding areas would get supplies from the market and then sell them in small towns or villages. The wholesale markets in China were important outlets for distributing general merchandise like fireworks.

In the display fireworks market, the buyers were often central and local governments who would purchase the product for public shows on national holidays or special celebrations. Obviously, a local company would have advantages in supplying to the local government in its area. Large fireworks shows usually would use invited bidding to decide on suppliers. The amount of fireworks used could range from RMB100,000 to several million yuan, depending on the scale of a fireworks show.

Account receivables and bad debt control was a problem not just for fireworks manufacturers, but for all businesses in China. Bad debts and lack of respect for business contracts had created a credit crisis in China. The bad debt problem greatly increased transaction costs, slowed down the cash turnover, and had become a headache for fireworks manufacturers. Some had chosen to withdraw from selling in the domestic market, although the profit margin was higher than in the export market.

Legal restrictions, local protectionism, cutthroat price competition, hard-to-penetrate distribution channels and bad debt were impacting negatively on the domestic sales of Liuyang fireworks. In 1997, seeing the decline of its fireworks sales, Liuyang Firecrackers and Fireworks Industry Department, the government agency in charge of the overall development of the pillar industry, decided to start an offensive strategy. First, it opened local offices in most of the 29 provinces, major cities and regions to promote Liuyang fireworks. Second, it regulated the prices that Liuyang fireworks companies could quote and sell in export sales. Third, it resorted to a government-to-government relationship in order to secure contracts for large public fireworks displays in each province. One year after introducing the offensive strategy, Liuyang fireworks sales had increased. By 2009, they controlled an estimated 60 per cent of the global market.

Over the next ten years, many legal restrictions were lifted. One of the most notable legal restrictions to be eased was foreign direct investment. With huge growth in both the Chinese domestic market and with China nearing a virtual lock on the export market, the Chinese Fireworks industry had become a magnet for foreign investors. Liuyang remained the center of the Chinese fireworks industry and an attractive region for foreigners and foreign firms looking at controlling the entire fireworks value chain.

THE EXPORT MARKET

Since the opening of the Chinese economy in 1979, exporting had become a major market for the Chinese fireworks industry. As one of the most celebrated products out of China, export sales of fireworks had risen dramatically between 1978 and 2009. According to independent research, the recorded exports of firecrackers and fireworks reached US\$675 million in 2009. This was up from an estimated US\$143 million in 1994.

The products from China were rich in variety and low in price, but also had a lower reputation in quality control, packaging and timing control, compared to the products made in Japan and Korea. Chinese-made fireworks also would wholesale for much lower prices, usually 80 per cent lower than similar products made in Japan or Korea.

There had been little overall co-ordination of export sales. As more and more companies were allowed to export directly, competition kept intensifying and the profit margins on export sales kept slipping. As a result, underpricing each other became a common practice. Therefore, despite its dominant share of the world market, the Chinese fireworks export industry enjoyed limited profitability. The export price of Chinese fireworks was between one-fifth and one-third the wholesale price in the United States.

The importers enjoyed a high markup even after paying the 2.4 per cent U.S. import duty. Of course, the importers had to absorb the cost of getting permits, shipping, storing and carrying the inventory for three to four months before making the sales. This gap pushed both domestic and foreign companies to find ways to control more of the value chain from production to retail.

Besides suffering from low profit margin, the Chinese fireworks makers were also risking losing their brand identities. Given the low cost and reasonably good quality of the Chinese fireworks, many large fireworks manufacturers and dealers in the West started to outsource the making of their brand-name fireworks. Failing to see the importance of brand equity, the Chinese fireworks manufacturers were sometimes reduced to mere manufacturing outfits for foreign companies, gradually losing their own brands. There were also fireworks merchants in Korea, Japan or Spain, who would buy the products from China, and then repackage them, or replace the fuses with better quality ones, then resell them for much higher prices.

The export market was usually divided into five blocks: Southeast Asia, North America, Europe, South America and the rest of the world. The most popular market had been Europe, where the regulations on fireworks were less stringent, and orders were of larger quantities and better prices. The United States was considered a tough market because of complex regulations and high competition, nevertheless a necessary one if a company wanted to remain a viable world-player. While in the past, the Canadian market was virtually closed to the Chinese fireworks due to its regulations, by 2009, Chinese imports dominated the entire Canadian market.

The foreign importers were powerful buyers for several reasons. First, they were very well informed, both through past dealings with China and the Internet. Second, they were able to hire agents who were very familiar with the industry in China. Third, they could deal directly with the factories that were willing to offer lower prices. Fourth, there were basically no switching costs, so they could play the suppliers against each other.

The diversity of the cultures in the destination countries greatly reduced the seasonality of the fireworks production and sales. As a result, orders evened out throughout the year. However, the peak season was still towards the end of the year. For the U.S., it was before July 4. Usually, the importers would receive the shipment two or three months beforehand. While the U.S. was still China's major export market for fireworks, other countries were also importing large quantities of Chinese-made fireworks (see Exhibit 4).

The Internet had become a marketing outlet for Chinese fireworks. 20 per cent to 25 per cent of the worldwide sales were through the Internet. However, export sales were still made mainly through foreign trade companies or agents.

In recent years, foreign investments were also funneled into the fireworks industry. In Liuyang, four of the large fireworks factories had foreign investments, made mainly by the fireworks trading companies in Hong Kong. In 2009, the Liuyang Fireworks Company was listed on the Toronto Stock Exchange (TSE), a first for a Chinese fireworks manufacturer.

The Future of the Fireworks Industry in China

The managers of the Chinese fireworks companies that Jerry talked to expressed mixed feelings towards the future outlook of their industry. One pessimistic view was that fierce competition and more stringent safety regulations were killing the industry. As the Chinese economy advanced, the government was forcing more manufacturing regulations onto firms that were driving up costs. Moreover, as people became more environmentally-conscious and more distracted by the endless diversities of modern entertainment, traditional celebrations using firecrackers and fireworks would die a gradual death. As to the function of attracting public attention for promotional purposes, fireworks also faced challenges from new technologies, such as laser beams combined with sound effects.

In fact, "make-believe firecrackers" already appeared as substitutes in China. These were made of red plastic tubes strung together like firecrackers with electric bulbs installed inside the tubes. When the power was turned on, the lights would emit sparks, accompanied by crackling reports that sounded like firecrackers. These were being used at weddings and grand openings in cities where firecrackers and fireworks were banned. More interesting substitutes were spotted at some weddings in Beijing, where people paved the road with little red balloons, and made the limousine carrying the bride and groom run over the balloons to make explosive cracking sounds as well as leave behind red bits and pieces of debris. Also, more and more young couples were getting married in western styles, in a church or a scenic green meadow outdoors, where serene and quiet happiness prevailed over the traditional noisy way of celebrating. Therefore, some managers believed that firecrackers and fireworks were doomed to fade off into history.

The more optimistic view, however, was that the industry would not die at all. If the right moves were made by the industry, it could even grow. Some said that tradition would not die so easily. It was in their national character for the Chinese to celebrate with an atmosphere of noisy happiness. Moreover, even in the West, the popularity of fireworks was not suffering from all the regulations. No real substitutes could

replace fireworks, which combined the sensual pleasures of visual, audio and emotional stimuli. For instance, the U.S. Congressional resolution in 1963 to use bells to replace fireworks in celebrating Independence Day never really caught on.

Fireworks were also being combined with modern technologies like laser beams, computerized firing and musical accompaniment to make the appeal of fireworks more irresistible. The safety problem was not really as serious as people were made to believe, and would only improve with new technological innovations like smokeless fireworks. With the success of the fireworks displays at the Beijing Olympics, China's brand as a world-class fireworks producer was on the rise. With better management practices, perhaps margins could be increased.

However, both sides agreed that the Chinese fireworks industry would have to change its strategy, especially in international competition, to stay a viable and profitable player.

THE DECISION

While the Liuyang fireworks industry dominated the worldwide industry, Jerry had to decide whether he should invest in the industry. If he did invest, what was the best way to capitalize on the potential that remained unexploited in this industry? He wondered whether he could apply the industry analysis framework he had studied in his MBA program.

Exhibit 1

**CHINA & LIUYANG FIRECRACKERS AND FIREWORKS:
TOTAL REVENUE
(US\$000)**

| | 2007 | 2009 |
|---|-------------|-------------|
| Total Revenue Domestic (estimated) | | |
| All China | 742,395 | 1,009,757 |
| Liuyang | 450,000 | 757,500 |
| Total Revenue Exports | | |
| All China | 494,930 | 673,171 |
| Liuyang | 300,000 | 505,000 |
| Total Revenue (estimated) | | |
| All China | 1,237,325 | 1,682,928 |
| Liuyang | 750,000 | 1,262,500 |

Sources: *International Fireworks Association;*
ICON Group Ltd "The World Market for Fireworks: A 2009 Global Trade Perspective

Notes:

1. *Domestic Revenue estimate based on a 6:4 domestic to export ratio as reported by <http://www.articlesbase.com>.*
2. *Alternative sources put the Chinese domestic market much higher.*
3. *2009 data and 2007 data are from different sources. Caution should be used when making comparisons. Growth rates of 15 to 18 per cent per year have been reported by other news sources (especially: <http://www.newsreelnetwork.com>)*

Exhibit 2

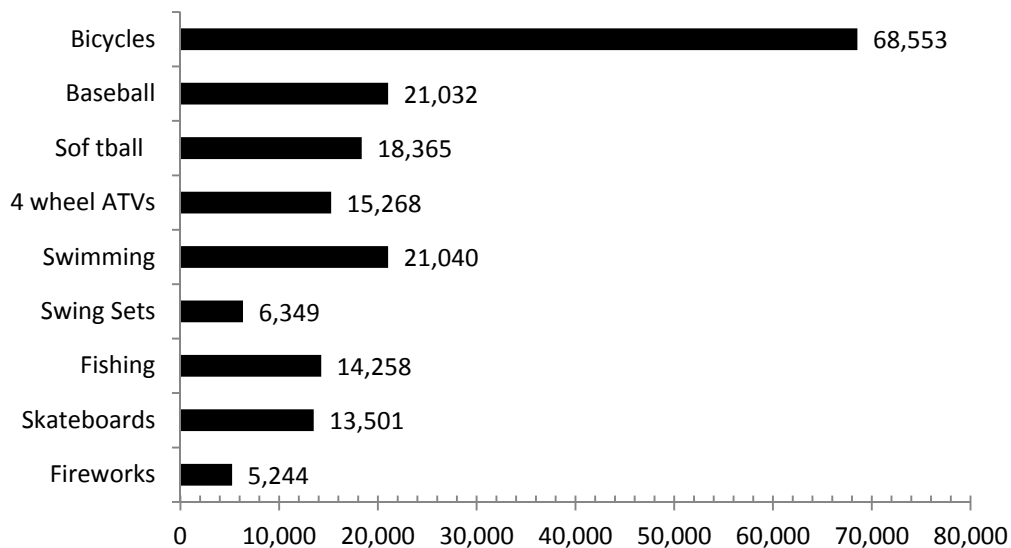
TOTAL FIREWORKS CONSUMPTION AND ESTIMATED FIREWORKS-RELATED INJURIES IN U.S., 2000 TO 2008

| Year | Fireworks Consumption, Millions of Pounds | Estimated Fireworks-Related Injuries | Injuries per 100,000 Pounds |
|------|---|--------------------------------------|-----------------------------|
| 2000 | 152.6 | 11,000 | 7.2 |
| 2001 | 161.6 | 9,500 | 5.8 |
| 2002 | 190.1 | 8,800 | 4.6 |
| 2003 | 220.8 | 9,700 | 4.4 |
| 2004 | 236.2 | 9,600 | 4.1 |
| 2005 | 281.5 | 10,800 | 3.8 |
| 2006 | 278.2 | 9,200 | 3.3 |
| 2007 | 265.5 | 9,800 | 3.7 |
| 2008 | 213.2 | 7,000 | 3.3 |

Source: American Pyrotechnics Association.

Exhibit 3

ESTIMATED EMERGENCY ROOM TREATMENT PER 100,000 YOUTHS (AGES 5 TO 14) FROM OUTDOOR ACTIVITIES (JUNE 22 TO JULY 22, 2008)



Source: American Pyrotechnics Association
As cited from the CPSC National Injury Information Clearinghouse

Exhibit 4

FIREWORKS EXPORTS FROM CHINA, 2009

| Country of Destination | Rank | Value (000 US\$) | % Share | Cumulative % |
|------------------------|------|------------------|---------------|---------------|
| United States | 1 | 301,500 | 44.8 | 44.8 |
| Germany | 2 | 83,553 | 12.4 | 57.2 |
| United Kingdom | 3 | 33,645 | 5.0 | 62.2 |
| The Netherlands | 4 | 32,586 | 4.8 | 67.0 |
| Japan | 5 | 26,764 | 4.0 | 71.0 |
| Russia | 6 | 16,157 | 2.4 | 73.4 |
| Italy | 7 | 15,967 | 2.4 | 75.8 |
| France | 8 | 13,574 | 2.0 | 77.8 |
| Spain | 9 | 13,009 | 1.9 | 79.7 |
| Denmark | 10 | 9,935 | 1.5 | 81.2 |
| Canada | 11 | 9,817 | 1.5 | 82.7 |
| Poland | 12 | 9,580 | 1.4 | 84.1 |
| Taiwan | 13 | 8,130 | 1.2 | 85.3 |
| Finland | 14 | 6,002 | 0.9 | 86.2 |
| South Africa | 15 | 5,623 | 0.8 | 87.0 |
| Austria | 16 | 5,488 | 0.8 | 87.8 |
| Ukraine | 17 | 5,445 | 0.8 | 88.7 |
| Sweden | 18 | 4,868 | 0.7 | 89.4 |
| Albania | 19 | 4,835 | 0.7 | 90.1 |
| Argentina | 20 | 4,793 | 0.7 | 90.8 |
| Turkey | 21 | 4,592 | 0.7 | 91.5 |
| Belgium | 22 | 4,583 | 0.7 | 92.2 |
| Norway | 23 | 4,336 | 0.6 | 92.8 |
| Czech Republic | 24 | 4,312 | 0.6 | 93.5 |
| Venezuela | 25 | 4,257 | 0.6 | 94.1 |
| New Zealand | 26 | 4,024 | 0.6 | 94.7 |
| Switzerland | 27 | 3,316 | 0.5 | 95.2 |
| South Korea | 28 | 3,104 | 0.5 | 95.6 |
| Thailand | 29 | 2,720 | 0.4 | 96.0 |
| Indonesia | 30 | 1,925 | 0.3 | 96.3 |
| Other | 31 | 24,731 | 3.7 | 100.0 |
| Total | | 673,171 | 100.00 | 100.00 |

Source: Professor Philip M. Parker, INSEAD, copyright © 2009, www.icongrouponline.com