

# **How Do Small Firms Survive Competition in China's Emerging Air Purifier Industry?**

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*This study investigates small firms' competitive strategy in the emerging air purifier industry in China. Based on archival and interview data, I argue that small firms may not avoid competition with large firms in both mainstream and niche markets, but they are likely to be accommodated by large firms. To survive, small firms are challenged more by the demand side than the competition side. It would be more helpful if they target the niche markets because these markets offer favorable conditions for them to reduce the negative impact of a major weakness they possess: the unknown brand. The study provides implications for a key question in the small business literature: whether small firms should be in large firms' territory and compete with them.*

## **INTRODUCTION**

Air purification has recently become a hot topic in China due to its heavy pollution. Air pollution results from a variety of sources including automobile exhaust, chemical factories, power plants, industry boilers, painting and decorative materials, etc. Individuals have little control over the outdoor air quality, but they are likely to improve the air quality of their indoor environment. As a result, Chinese people have started to use air purifiers to clean their indoor air and the air purifier industry has thus begun to emerge. Hundreds of companies, domestic and foreign, have entered this industry in recent years. According to Liu et al (2015), the number of air purifiers sold in 2012 reached 1.26 million and it nearly doubled in 2013. Despite the fast growth, the air purifier penetration rate in the Chinese market is still very low compared with that in the developed countries. In the household segment, for example, the penetration in Korea is approximately 71%, US 27-30%, and Japan 17%. In China, however, it is below 0.3%, suggesting a huge market potential.

Air purifier producers vary, ranging from multinational corporations which have a business unit in the air purifier industry to small entrepreneurial firms specializing in the air purifier production and selling. For the purpose of this study, I focus on small specialized firms. Because of resource constraints, small firms tend to face greater pressure to survive than their larger counterparts in a competitive market (Aldrich & Auster, 1986). A common theory is that they should avoid competing with large firms directly (Kao, 1981), so a niche strategy is probably their best choice. However, small firms also have their own strengths. Today's small firms may well become tomorrow's major corporations (Davis et al., 1985), implying that they may still engage in direct competition with large firms. According to Chen and Hambrick (1995), small firms' success is largely determined by how they compete. They often perform better if they use different strategies from those used by large firms (Caves & Pugel, 1980). In this study,

I investigate how small air purifier producers might compete in order to survive in an industry dominated by large firms with deep pockets.

The remainder of the paper is organized as follows. First, I present an overview of the air purifier industry in China. Second, I review the literature on competitive strategies with a focus on small firms. To simplify the analysis, I group firms into “small” and “large” categories. Following Chen and Hambrick’s (1995) definition, I treat “small” and “large” as relative rather than absolute size. I include small and medium enterprises (SMEs) in the small firm category. SMEs have been extensively studied in the small business literature. Third, I compare different strategic choices for small firms in the air purifier industry and then develop an argument as to what strategic alternative might be best for them based on the archival and interview data. Finally, I discuss implications and future research directions.

## **CHINA’S AIR PURIFIER INDUSTRY**

Air purifiers appeared in China as early as mid-1990s, but they have not become a financially viable business until recent years during which the worsening outdoor air has affected people’s indoor environments including living and working, triggering a demand for air purifiers. The indoor air pollution is caused by airborne pollutants which take three forms: particulate, gaseous, and microbial. PM<sub>2.5</sub>, airborne particles equal to or smaller than 2.5 micrometers in diameter, is a major concern for people in China. These fine particles can get deep into the lungs and cause respiratory and cardiovascular problems. The sources of PM<sub>2.5</sub> are largely outdoor-related. Gaseous pollutants include formaldehyde and odors that mainly come from indoor remodeling and cooking. Formaldehyde concerns Chinese people as it causes health problems like coughing, headaches, dizziness, skin rashes, etc. Microbial pollutants are viruses and bacteria which particularly concern certain organizations like hospitals.

### **Customers**

Customers fall into two categories: household and organizational. Household users constitute the mainstream market in this industry dominated by large firms, while organizational users are a potential segment which is growing. Household users often possess the following three characteristics. First, most of them are health conscious. Usually, family members, including children, senior people, and pregnant women who need to be taken of, are the main drivers of air purifier purchasing. Second, they sometimes purchase air purifiers to solve specific problems such as formaldehyde and other harmful substances resulting from house remodeling. Third, they are often well-educated. They know the consequences of living in a polluted environment and the possibilities of using technology to clean the indoor air. Organizations including both for-profit and non-for-profit are gradually becoming important customers. They use air purifiers to improve the work environment for their employees or patrons. Some particular organizations like hospitals are interested in using air purifiers to improve their operational performance and services.

Customer purchasing is highly associated with the level of outdoor air pollution. Pollution tends to be higher in the period from late fall to early spring which is the peak season of this industry. Most sales occur in this season, but they are not spread evenly across time. The weather conditions have a major impact on people’s final purchase decisions. If smog is expected in the next few days, people would rush to buy air purifiers. Firms are likely to face out-of-stock if such an inclement weather is occurring (Li, 2015a). Therefore, air purifiers are seasonal products to a large degree in China.

Customers’ purchasing criteria vary. Though the effectiveness of air cleaning is often the first consideration for most people, other factors are also becoming important influencing factors. Li (2015b) reported a survey of 163 people with ages ranging from 20 to above 50 who were asked about what factors they would consider when choosing an air purifier. Table 1 shows those factors and their importance measured by the percentage of people surveyed who valued a specific factor. For the criterion “multiple functions,” 53.85% people valued a humidification function of the air purifier. This function has already been adopted by some competitors, but it has not worked well as expected. Price is another important consideration. It ranges from below ¥1,000 to above ¥20,000. A majority of people prefer low-

end air purifiers. Table 2 shows people's expected prices based on a survey of 1,410 people in the 1st-tier, 2nd-tier, and 3rd-tier cities, conducted by both China Advertisement and Digital 100 Market Research.

**TABLE 1  
CUSTOMERS' PURCHASING CRITERIA AND THEIR IMPORTANCE**

<b>Purchasing Criteria</b>	Cleaning Effectiveness	Multiple Functions	Brand	Price	After-Sales Service	Aesthetics
<b>Percentage of People</b>	79.77%	60.12%	44.51%	43.93%	38.73%	22.54%

**TABLE 2  
CUSTOMERS' EXPECTED PRICES**

<b>Price Range</b>	Below ¥1,000	¥1,000-¥2,999	¥3,000-¥4,999	¥5,000-¥7,999	Above ¥8,000
<b>Percentage of People</b>	30.2%	46.2%	18.0%	4.7%	0.9%

### Competitors

In 1990s, there were only a few firms running an air purifier business. The market had been too small to attract new firms to enter for more than a decade. In the winter of 2011, a large part of China experienced problems with smog and air pollution has been persistent since then in many cities (Hu et al, 2015). For example, based on the data provided by Zhang and Hong (2015), only 16 of 161 cities in China met the air quality standard in 2014. As people became interested in using technology to improve their living and working environments, new firms have started to enter the air purifier industry. According to China Air Purifier Bluebook (2015), as of 2013, there were already 151 firms competing in this industry. In 2014, new entries surged, with the number of competitors reaching 556. Among them, about 80% were domestic firms, but it was the foreign firms that controlled 80% of the market. Firms continued to enter this industry in 2015 and the number of brands reached 836 (Yu, 2015).

Competitors can be classified into three groups: diversified firms, specialized firms, and entrepreneurial firms. Diversified firms include both multinational corporations and domestic large firms. Some of them already had businesses related to air purification before entering this industry, so their entries seem to be natural. They can take advantage of their existing resources, channels, or customer bases to explore opportunities in the new market. Some did not have any related experiences. Their entries do not seem natural, but the huge potential market of this industry is likely to attract any type of firms. Examples of diversified firms include 3M, Honeywell, Lenovo, Panasonic, Philips, Sharp, Sumsang, etc. Specialized air purifier firms come from different countries where they had already sold air purifiers in their own countries or other countries before entering China. Entrepreneurial firms are created by individuals who perceive air purifiers as an opportunity and try to grab a piece of cake in this new industry. These three groups of competitors have made the industry highly competitive, though it is still in its early stage of life cycle. Industry concentration is relatively high. According to Xu (2015), the top 15 competitors, less than 3% of all competitors, accounted for 84.8% of industry sales, indicating most competitors are struggling in this industry.

### Product and Technology

Generally, air purifiers are not a complex product. They include a limited number of components, mainly the filter or other cleaning technology, the motor, and the housing. Different technologies, including HEPA, activated carbon, negative ion generator, photocatalytic oxidation, ultraviolet light, and electrostatic filters, have been employed to remove the indoor airborne pollutants. They function in

different ways and each of them has pros and cons. For example, some of them are effective in removing airborne particles and some are effective in removing viruses, harmful gases, and odors. Some technologies have a long lifespan, but will generate undesirable byproducts like ozone; others are just the opposite. Since no single technology can remove all types of pollutants effectively, some firms have tried to combine two or more technologies, asserting that they would provide complete solutions to the indoor air pollution problems in China. However, the results are yet to be seen.

### **Distribution**

There are two broad distribution channels: offline and online. Offline channels are traditional. Producers used to sell air purifiers by themselves or through distributors. Retail stores have been used particularly by firms with deep pockets. Since 2014, a majority of competitors have started selling air purifiers through online platforms and offline sales have been gradually decreasing since then (China Air Purifier Industry Blue book, 2015). Online selling has two advantages. First, it is less limited by geographical locations. Second, operational costs are relatively low. There are two main types of online platforms for air purifiers: general and specialized. The former includes JD, Taobao/Tmall, and Amazon. JD is most popular. Based on JD website, as of June 2015, there were 416 firms selling air purifiers through its platform. Among them, 360 were domestic firms and 56 were foreign firms representing 11 countries. Specialized online platforms focus on a certain kind of products or services. Since children, old people, and pregnant women are the main drivers of air purifier purchasing in the household market, competitors have paid attention to online channels associated with those people. For example, baby product websites have been used by some competitors to promote and sell their air purifiers.

### **Industry Regulation**

The industry standard for air purifiers was first issued in 1995 and was revised several times since then. As demand for air purifiers increased recently, competitors have used inappropriate promotional approaches such as overstating the effectiveness, misleading, and even cheating to attract consumers. In a random product quality check, China's quality watchdog for the household electric appliances reported that some air purifiers almost did not clean the air (Jing, 2015). The industry standard was blamed for having little control over this market irregularity as it left room for misinterpretation, manipulation, and other unethical practices. As firms complained about the inappropriate competition and consumers complained about low quality and services, calls for improving the existing standard have been made. China issued a new industry standard in late 2015 which took effect in March 2016. The new version, in relation to AHAM standard in the US, has raised the bar for doing business in the air purifier industry. At the same time, it has also increased the barriers for new entrants.

### **Possible Trends**

The air purifier industry has grown faster than expected, but it is still relatively new. People are not readily accepting air purifiers as a solution to their indoor air pollution problem. According to Li (2016), mainstream customers still have limited knowledge about air purifiers and typically hold a skeptical attitude toward these machines. Some people own such a machine for "psychological comfort" because it feels good in times when smog occurs.

The industry structure may change and competition is likely to become fiercer in the near future. Usually, the first quarter of the year is the busiest time for air purifier producers. In both 2013 and 2014, industry sales in the first quarter grew dramatically compared with the same period of the previous year. In 2015, however, the growth rate in this period became negative (Lian, 2015), which triggered speculations about the industry. Some analysts asserted that industry shakeout might have started (Li, 2015a; Lian, 2015), which is supported by recent exits of many competitors. For example, in the period from January to October in 2015, the number of brands reduced from 836 to 673, nearly 20% of reduction in less than one year (Yu, 2015). Though the improved outdoor air quality might be an explanation for the exits, according to Li (2015a), however, competitors' lack of discipline and consumers' mistrust could also be important influencing factors.

Competitors' behaviors and strategies might also change. First, the irregular practices would be less likely to occur due to the implementation of the new industry standard. Second, more competitors would emphasize online selling. Online sales first exceeded offline sales in 2014. In 2015, the top 5 competitors took away 70% of offline sales, but they only accounted for 49% of online sales (Xiao, 2015), suggesting that the online portion of the market is more fragmented, which creates opportunities for small firms.

The evolution of the air purifier industry might also be affected by the macro environment. The outdoor air quality has important impact on the indoor air quality (Li et al, 2015). The outdoor pollution like smog may be controlled by government policies. According to Lei (2015), Beijing suffered from heavy smog just 10 days before APEC 2014 it was going to hold. During the time of the conference, however, Beijingers saw blue skies jokingly described as "APEC Blue," which was a result of temporary closing-down or limited operations of thousands of businesses. Actually, the Chinese government at different levels has already started handling the severe air pollution problem. The possible improvement of air quality would affect the air purifier industry, but any significant change is not expected in the foreseeable future. According to Yu and Xu (2014), US has used nearly 50 years and numerous resources to reduce PM2.5 to a low level. As a developing country, China still has a long way to go.

## **SMALL FIRMS' COMPETITIVE STRATEGY**

In a competitive market, firms can take offensive or defensive actions to cope with competitive forces to survive and grow. The strategic management literature already has extensive works on competitive strategy, but according to Lee and colleagues (1999), their applicability to small firms is limited. For example, Porter's (1980) generic strategy framework has been widely used to guide strategic actions. To outperform competitors, firms can choose one of the three generic strategies: broad cost leadership, differentiation, and focus. When the framework applies to small firms, there could be implementation problems because small firms do not have sufficient financial resources to effectively implement overall cost leadership or differentiation (Ebben & Johnson, 2005; Lee et al, 1999).

How should small firms compete in the marketplace? Many studies have been conducted. Approaches used vary, but they tend to start from small firms' internal characteristics: weaknesses or strengths, which leads to two conflicting arguments: avoiding competition with large firms by focusing on niche markets or competing with large firms head on. It is still unclear which strategy works better for small firms. In this section, I review the literature on small firms' competitive strategies. I start from the two approaches and then discuss an extended framework which may provide implications for resolving the conflicting arguments.

### **Strategy Based on Weaknesses**

Small firms have limited financial resources and managerial capacity (Mascarenhas, 1989), which obviously puts them in a disadvantageous position based on the resource-based view. They also suffer from a "liability of smallness" and it's hard for them to gain recognition, obtain external financing, and establish legitimacy (Aldrich & Auster, 1986). In contrast, large firms can enjoy benefits from their size, abundant resources, brand awareness, and established relationships and obtain economies of scale, economies of scope, and experience curve effects. They can also enjoy bargaining power over suppliers and customers and control the market through leadership pricing (Porter, 1980). Given the weaknesses small firms possess in a competitive market, they have been advised not to meet large competitors head on but pursue a niche strategy looking for segments neglected by their large counterparts. This "competition-avoiding" argument is intuitively appealing and has been advocated in the small business literature (e.g., Kao, 1981; Weinstein, 1994). However, Lee et al (1999) raised a question about this argument: if niches are profitable, why would large firms ignore them? Actually, more than 75 percent of Fortune 500 companies have used a niche strategy for some of their products (Linneman & Stanton, 1991), suggesting that niches are not safe anymore.

### **Strategy Based on Strengths**

Though small firms are obviously disadvantaged in many ways, some scholars contended that they still can compete directly against the market leaders (Cooper et al, 1986) and are likely as effective as their large counterparts (Chen & Hambrick, 1995). These arguments are based on small firms' strengths relative to large firms. Small firms tend to be structurally simple and streamlined; they are often less bureaucratic; and they generally have few formal systems and procedures in place. These characteristics give them speed (Katz, 1970), agility, and flexibility (Fiegenbaum & Karnani, 1991). In contrast, large firms are subject to structural inertia (Hannan & Freeman, 1984) and are likely "locked into" existing products, prices, and cost positions (Cooper et al, 1986). Building upon their comparative advantages, small firms may launch competitive actions more easily. They may be quicker to seize opportunities which are fleeting. They are also likely to serve as agents of change through innovative activities (Audretsch, 2001). They do not have to seek protected niches that are too small to attract large firms' attention. Instead, they may adopt a broad range of activities (Carter et al, 1994). Empirical studies have supported some of these arguments. For example, using US airlines as a sample, Chen and Hambrick (1995) found that small firms tended to be more active than large firms in launching competitive actions.

### **Generic Strategies for Small Firms**

The weakness- and strength-based approaches have generated conflicting arguments about how small firms should compete. According to Lee and colleagues (1999), one major limitation of existing studies on small firms' competitive strategies is their failure to explicitly consider the competitive reactions of the large rivals to small firms' actions. An implicit assumption of extant research is that large competitors would respond aggressively if small firms enter their territories. According to Cooper et al (1986), however, an aggressive response by large firms is not always easy because they face barriers. Retaliation is likely to be more costly than accommodation (Lee et al, 1999). Considering the possible reactions of large competitors to small firms' strategic actions, as well as the resource constraints faced by small firms, Lee et al. proposed three generic strategies for small firms: niching, free-riding, and strategic alliances.

A niching strategy is about filling market gaps by offering products that are substitutable to that of their large competitors who are exploiting the same niche markets. Large firms are less likely to aggressively attack small firms because such an attack will depress prices not only in those niches, but also in all other markets where substitutable products are currently supplied by them. As a result, they would be forced to accommodate small competitors to protect their own interests, though they have to incur a loss of some market shares. According to Lee et al., the niching strategy is different from Porter's (1980) focus strategy. The latter is associated with either differentiation or low cost, while the former does not have to address each of them. Small firms may also supply products identical to that of their large competitors in the same markets. Under this circumstance, free-riding occurs because small firms would take advantage of large firms' market development and promotion efforts. It is also likely that large competitors choose to fight the entry of small firms rather than accommodate them despite the high cost of such a strategy. If this is the case, small firms should form strategic alliances to overcome the disadvantages of resource shortages and confront their big rivals.

### **Summary**

Though small firms have their own strengths, their weaknesses are often more obvious, which leads to a key question in the literature: whether they should confront their large rivals. The literature does not give a clear answer. I argue that weaknesses and strengths are only basic inputs for small firms' competitive strategy. It would be too simple if small firms only use weaknesses or strengths to guide their strategic choices. Lee et al.'s (1999) concept "accommodation" provides a new angle viewing competition between small and large firms. Competition does not necessarily mean one competitor defeats the other; it can also mean coexistence. The concept might help resolve the conflicting arguments in the literature.

Dean and colleagues' (1998) empirical study suggests that the industry characteristics have important impact on how small and large firms compete. It may be argued that small firms need to avoid confronting their large rivals in some circumstances, but in others they have to compete head on. In this study, I complement the traditional weaknesses/strengths approaches by incorporating the concept "accommodation" and the industry context to examine small firms' competitive strategy.

## **SMALL FIRMS' SURVIVAL IN CHINA'S AIR PURIFIER INDUSTRY**

On the most basic level, air purifiers are used to clean air. They must be effective in removing the pollutants people are concerned with to exist viably in the marketplace. In the past years, the irregularities in China's air purifier industry has led to consumers' mistrust. In the future, competitors, whether large or small, will need to go back to basics: solving customer problems by providing quality products. The new industry standard has set technical requirements for any firm to be a viable player in this industry. Consumers are learning and will be more knowledgeable, which will make the overstatement of product functions and the practice of misleading and cheating not work anymore. Competition will be fiercer, but the playing field is likely to be more level.

Going back to basics is necessary, but not sufficient for success in the future. For small firms with limited resources, the challenge is obvious, but small firms are often entrepreneurial, so the new competitive arena could also be an opportunity for them at the same time. They need a strategy to navigate the competitive landscape. Based on the small business literature, small firms may survive competition by avoiding competition with large firms. If they adopt this strategy, they will need to find niches ignored by large competitors. They may also survive competition by confronting their large rivals. In this case, they will compete for the same customers. Large firms may either accommodate small firms and tolerate a loss of some market share or take retaliatory actions such as price reduction in order to drive small firms out of the market. In the following sections, I discuss which strategy applies to small firms in a better way in the air purifier industry.

### **Avoiding Competition with Large Firms**

Small firms' resource constraints have made avoiding competition with large firms an appealing strategy. In the air purifier industry, small firms might choose niche markets small enough so as not to attract large competitors' attention. In order for those niches to exist, customers may have specific needs, but large firms are not interested in developing customized products to satisfy their needs. Customers may also have general needs, but it is not financially feasible to satisfy their needs. For example, if firms do not have distribution channels in certain geographical areas, they might choose not to serve people there because by doing so they would need to invest in logistics. Given the context of the air purifier industry, the opportunity for exploiting niches neglected by large firms is limited and will become rarer as the industry continues to evolve. There are two reasons.

First, online selling is increasing in this industry, which makes both purchasing and selling less affected by geographical locations. As a result, location-based niches would diminish. Second, the product itself is not complex. It is relatively easy to make a change to certain parts to create different products and satisfy different customer needs. On the demand side, people purchase air purifiers mainly for cleaning their indoor air. They are mainly concerned with one or more of the three major pollutants as described previously. Most large competitors have developed a variety of models to address people's different concerns. It is not very likely that large firms neglect niche markets for technical or cost reasons. Therefore, small firms may not achieve success in this industry by avoiding competition with large firms. A better choice would be conducting competition in the mainstream market, niche markets, or both.

### **Competing with Large Firms**

When small firms compete with large firms, they target the same customers. As discussed earlier, most customers in this industry come from households. Both large and small firms have entered this mainstream household market. Large firms are likely to accommodate small firms for two reasons. First,

their main competitors are other large firms, not small firms. Second, it would not be wise from an economic point of view for large firms to attack small firms by reducing prices only for defeating them. Theoretically, small firms could have a chance to grab a small piece of market if their products are comparable. Given the nature of this product, it is not hard for them to make comparable products. In reality, however, very few small firms have achieved success so far.

To explore possible reasons, I conducted interviews in Beijing, the most important market in China. First, I interviewed three small competitors, two domestic and one foreign. Though they listed a variety of reasons as to why they had not achieved success so far, all three mentioned the same problem they encountered: no financial resources to promote their products and brands. They commented that promotion was particularly important in this industry due to customers' limited knowledge about air purifiers and their numerous choices when making a purchase. The more exposure a brand has had in the market, the more likely people would choose it.

Second, I interviewed two department stores and two household electric appliance stores which had air purifier sections. Customers in the store channel were mostly household users. My questions included their purchasing criteria and preferences. All four stores mentioned the criteria reported by Li (2015b): cleaning effectiveness, brand, price, multiple functions, after-sales services, and aesthetics, though their perception of the importance of each criterion was not exactly the same. When asked about what types of products sold better, the staff from all four stores had the same answer: those whose brands were better known. They also noted that though customers would never buy an ineffective air purifier, they seldom purchased the most effective one if its brand was little known.

My interviews indicate that small firms are seriously disadvantaged when competing for the mainstream household customers. Large firms are able to invest heavily in promotions including using mass media advertising. For small firms, heavy advertising is unrealistic. To overcome their resource limitations, small firms may use strategic alliances (Lee et al, 1999) to combine resources from other small firms. During my interviews with the three small competitors, I asked whether they would have an interest forming strategic alliances with other small firms so that they could help each other and reduce the impact of resource shortages. All of them responded with a yes if the other party had special channels such as relationships with hospitals, schools, hotels, etc. Generally, special channels are less used for the mainstream market. But when asked if they would be willing to pool financial resources for promotion, none of them showed enthusiasm. They explained that in the mainstream market, the main competitors were multinational corporations like Honeywell, Philips, and Sharp, so an alliance among a few small firms would be of little help.

The discussion above leads to the following conclusion: it may not be a good strategy for small firms to target the mainstream household market, though large firms are likely to accommodate them. I argue that a niching strategy (Lee et al, 1999) would help small firms survive in a better way in the air purifier industry. Small firms may be more threatening to large firms in niche markets, but it is still likely that large firms accommodate them. Most large firms have both online and offline sales. They need to implement a consistent pricing policy for the two types of sales nationally. It would be too costly for them to reduce prices in order to drive out small firms in certain niches. To occupy niches, small firms could offer substitutable products or identical products (Lee et al, 1999). Offering identical products could help small firms free-ride on large firms' market development efforts such as customer education, but this free riding provides no help to the brand. Actually, it would harm brand building because copying others' products inevitably leads to a loss of one's own identity. Therefore, it would be better for small firms to supply substitutable products in niche markets.

To implement the niching strategy successfully, small firms need to address two issues. First, they will have to find potential niches. As discussed previously, niches are largely related to organizational users who exist in different industries or public sectors. Both for-profit and non-for-profit organizations such as hotels, banks, schools, hospitals, government agencies, etc., are potential customers. Some of them have already started using air purifiers to improve their working environments. The second issue, which is more challenging, is how to turn the potential customers into purchasers. For small firms, a major problem is their unknown brand which has been plaguing them. In China, air purifiers are classified

as household electric appliances. Unlike other products in this category such as refrigerators and air conditioners whose effects can be immediately felt or seen, air purifiers can hardly give people direct experience. As a result, it is more difficult to turn a potential customer into a purchaser. That's another reason why brand is so important in this industry. Fortunately, organizational users as niches have some characteristics which can help small firms mitigate their weaknesses.

First, organizational users may not display the same purchasing behavior as the household users. Based on my interviews with the small firms and retail stores, organizational users tend to be more practical than household users when making purchase decisions. For example, they often emphasize problem-solving and value the functional aspects like cleaning effectiveness over non-functional features like brand and aesthetics, which would help small firms reduce the negative impact of their unknown brand. Second, it is easier to provide individual services to a relatively small number of organizational users than the mainstream household users. Since organizational users emphasize problem-solving, small firms will need to demonstrate their products can do the job, but the problem is that people can hardly feel the effect of air purifiers. Luckily, their effect can be "seen" through technology. Competitors have started to use air pollution detectors to show the effectiveness of their air purifiers by comparing the number of airborne pollutants before and after using their products. Small firms do not have advertising dollars to promote their brand in the mainstream market, but could promote their products by demonstration to individual customers, which is more feasible in the niche markets than the mainstream market. In addition, an organizational customer often purchases more than one unit, which makes on-site services less costly. Schools are an example of a niche small firms may target. In China, children have been receiving excessive care from their parents and grandparents for both cultural and one-child policy reasons. Based on a survey of 50,850 people in Beijing conducted by Wang (2016), 98% supported the idea that air purifiers be installed in classrooms in kindergartens and elementary schools. In addition, 70% of those surveyed would be willing to partially fund the initiative. Hospitals are another example of a niche for small firms. One small foreign competitor I interviewed has already successfully sold its air purifiers to kindergartens, hospitals, and some other organizations through demonstrations.

## **DISCUSSION**

In this study, I investigate how small firms compete in order to survive in China's emerging air purifier industry. Based on the archival data and interviews, I argue that small firms may not avoid competing with their large counterparts and large firms may not aggressively attack small firms targeting the same customers. The current industry conditions would make it possible for large and small firms to coexist in both mainstream and niche markets. However, I propose that small firms focus on niche markets and use a "niching strategy" (Lee et al., 1999). The reason is less associated with competition which often leads to an argument for a niche strategy, but more associated with the demand side: customers' knowledge and preferences.

The study provides two implications. First, it suggests that the industry context could be an important factor explaining whether small firms should compete with large firms: a key question in the small business literature. When niche markets are not safe anymore, small firms may not have choice but to compete with their large counterparts to survive. Large firms' possible accommodation of small firms provides a basis for small firms to target customers in large firms' territory without attracting retaliation. Second, when an industry is in its early stages of evolution, the demand side may have a greater impact on how small firms compete than the competition side. The traditional theory on competition is that a firm needs to do better than its competitors to survive and grow, so the point of reference often directs toward what and how competitors are doing. As Adner and Zemsky (2006: 215) argued, research on the competitive strategy tends to focus on "firms' supply-side interactions and largely neglect the demand environment in which these interactions take place." This study suggests that if customers have limited knowledge and are skeptical about the industry product, they would be more willing to trust the brand than the product itself. This would pose unusual challenges for small firms with limited resources. Under

this circumstance, the traditional competition theory might not work well. A possible solution is to turn attention from competition to the demand side.

The air purifier industry in China is evolving. Its future will be shaped by multiple factors, including both the industry factors such as competition and demand and the macro environment factors such as economic situations and government policies. Opportunities for research on small firms are ample. First, the concept “accommodation” proposed by Lee et al (1999) may have important implications for small firms’ survival and growth in this industry. This study assumes that small firms would be accommodated by large firms, but to what degree? If small firms have achieved success in certain niches like schools, would large firms attack them? How should small firms prepare and respond? Answers to these questions would help understand the concept “accommodation” in a better way. Second, online selling in this industry is a trend. It seems to be an attractive channel for small firms due to relatively low costs and high geographical reach. In addition, it can also help small firms improve their brand awareness. The problem is that it would be extremely difficult, if not impossible, for small firms to start online selling in the very beginning. How to persuade online shoppers to purchase an unknown brand? If online selling proves to be workable, how do small firms make online and offline channels complement each other so as to increase sales and expand the business? Third, the overall outdoor air quality is likely to improve in the future due to the government’s involvement, which will have important impact on this industry. It can be interesting to examine how competitors would adjust their strategies in order to keep up with the environmental change.

## CONCLUSION

Small firms are highly disadvantaged in the air purifier industry in China. They may coexist with large firms in both the mainstream household market and smaller organizational niches, but their survival will need distinctive strategies. This study suggests they pay more attention to the organizational users, which may help them reduce the impact of a key weakness they have in the current stage of industry evolution: the unknown brand.

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