Health in Flux: Plans for a consolidated, efficient, and Chinese pharmaceutical sector

Brian Spegele
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Executive Summary

In China today, as one-fifth of the world's population becomes healthier and wealthier, the demand for safe, affordable, and accessible pharmaceuticals will rise. To take advantage of that surging demand, investors should look to partner with growing firms, whose ambitions in recent years have been tempered only by a shortage in capital. By establishing joint ventures with growing manufacturing and research firms across key industry sub-sectors – generic producers, R&D-based pharmaceutical firms, and contract research organizations (CROs) – an investor's hand will firmly grip several corners of an industry destined to become a leader in China in terms of domestic sales and exports. Established joint ventures will aim to foster greater communication among disparate industry sub-sectors, and, where feasible, will begin merging existing firms in order to encapsulate a larger share of the market. Unlike in the United States, where the top 10 pharmaceutical firms account for 50 percent of the market share, the 10 leading firms in China today hold just 13 percent of the market share.[1] An influx of capital for ambitious firms and the merging of already successful ones will create an international supplier of both generic and patented drugs. Certain risks will accompany this investing strategy. These include China's current reputation for dangerous pharmaceutical exports, a weak intellectual property rights apparatus, and an opaque judicial system. Investors who are able to mitigate these risks, however, will quickly help establish the drug manufacturers of choice for China's multiplying consumer class, and present an alternative to multinational firms' high prices.

[1] Eliza Yibing Zhou, "China Pharma Basking In Its Spotlight" *Genetic Engineering and Biotechnology News*, March 1, 2007.

Economic Risks

The past 30 years have witnessed unmatched strides in the nature and scope of U.S.-China business relations. In 1978, it was impossible to predict how China would emerge from the shadows of Maoism, and whether issues such as inflation would altogether cripple the Chinese economy, as was simultaneously experienced in the many countries that implemented a "big bang" transition model, the economic development model that brought about rapid market liberalization promising an immediate payoff, while at the same time threatening hyperinflation.[2] In an attempt to maintain social, political, and economic stability, China's liberalization model was gradualist in nature and protective of domestic firms. Restrictive economic policies and a restive political system, however, have never been enough to keep investors away. Promises of an untapped 1.4 billion-person market have lured countless investors to the Middle Kingdom in search of "The China Dream."

To properly understand the potential for investing in China, it is necessary to first consider a wide-angle view of the country's economy. Despite double-digit GDP growth over the past decade, the global economic recession has hampered China, as it has the rest of the world. Economic growth slowed to 6.8 percent in the fourth quarter of 2008, down from 9 percent the year before. With more than 40 percent of China's economy based on fixed assets, a manufacturing slowdown meant millions of layoffs at factories across the country.[3] Even before the recession began, the Chinese government realized that further economic diversification was needed to make the export-based economy more self-sustaining.

[2] Barry Naughton, *The Chinese Economy: Transitions and Growth* (MIT Press, 2007), pp.96.
[3] James T. Arredy, "China Slowdown Stunts Entrepreneurs," *The Wall Street Journal,* March 27, 2009.

The recession underscored the country's need for self-sufficiency. State directives are aimed at breaking a culture of thriftiness brought on by an ancient history wrought with famine and a recent history spent without a modern social safety net. Today, China's personal savings rate is near 50 percent of income.[4] The Chinese government has taken steps to reduce this rate in recent years – chief among them the establishment of social programs like national health insurance and pensions for retirees – but there is little evidence that these efforts are working yet. Chinese officials warn that despite their efforts, a high savings rate is engrained in the Chinese culture, and the practice is unlikely to erode anytime soon.[5] For that reason, investors need to be wary of industries with high elasticity of demand. A savings rate of 50 percent bodes poorly for manufacturers of highly elastic goods. However, a growing middle class will no doubt first seek out basic necessities – like medicine, for example – as their purchasing power increases and these goods gradually become cheaper to them. High savings rates and a reliance on exporting goods have left the Chinese economy particularly susceptible to recessions abroad. However, national initiatives aimed at spurring domestic demand and the emergence of a vigorous middle class suggest a coming period of greater demand, especially for goods of low elasticity.

In direct relation to China's emergence as a manufacturing powerhouse, the country's ascension into the World Trade Organization in 2001 was a political curveball for the CCP. For foreign investors, WTO entry provided an opportunity to challenge China's dominant state-owned enterprises, but investors need to understand will not be a panacea for government protectionism.[6] For more than a decade, government conservatives have rallied against international firms challenging domestic ones, comparing this competition to Western

[4] Zhou Xin "China can't reduce savings rate quickly" *Reuters*, Feb 10, 2009.
[5] Zhou Xin "China can't reduce savings rate quickly" *Reuters,* Feb 10, 2009.
[6] Yong Wang "China's domestic WTO debate" *China Business Review*, January-February 2000, pp. 54-62.

colonization of China during the 19th century.[7] Despite WTO entry, questions have remained about China's commitment to free trade, with U.S. officials questioning whether China's market intervention is selective and determined to hinder foreign investors.[8] In addition, questions of intellectual property rights remain despite WTO commitments, though the government has repeatedly pledged to crack down on the problem. The Chinese government has passed legislation in recent years to meet WTO standards. In addition, WTO entry has made Chinese workers more market-oriented and has impacted businesses across the spectrum of China's economy. Premier Wen Jiabao describes the present as a "post-WTO transition period." [9] While that does not mean investors should expect entirely fair treatment from every local government official – whose allegiances are often to their own region, as opposed to the tenets of the WTO – Wen's comments signify a commitment at the national level to upholding the principles of free trade, and to provide ripe conditions for foreign investment.

In the process of developing an investment action plan, it is important to consider which industries and factors have shaped China's economy in the past. More importantly, however, it is critical to examine public and socioeconomic trends to ascertain what product or industry will shape China in the near and long-term future. China's economy is undergoing a dual-pronged transition. For 30 years, the country has gradually liberalized. More recently, the economy has continued to transition from an economy based on low-skilled manufacturing and exports to one that increasingly employs a technology-thirsty,

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[7] Yong Wang "China's domestic WTO debate" *China Business Review*, January-February 2000, pp. 54-62.

[8] Sun Liang and Zhang Xiangchen, "Redefining Development, Reimagining Globalization: The WTO and China's New Economic Vision," *Journal of World Trade*, Dec. 2007, pp. 1275-1295.

[9] Yong Wang, "How is China assessing its first five years with the WTO and what does the future hold?" *China Business Review*, September-October 2006.

well-educated workforce. As a result of favorable government policies, a more educated populous, and an increasingly powerful middle class, China's pharmaceutical industry is one among several industries destined to grow. That growth will satisfy a growing domestic demand for generic drugs, look to undercut overseas generic drug producers, and begin to research and develop patented medicines to compete with established foreign manufacturers.

A number of sub-sectors comprise the current pharmaceutical landscape. However, considering each of these sectors as entirely independent is misguided. In reality, the various sectors rely on one another to nurture growth. For example, firms looking to patent and market new medicines will only benefit from a thriving CRO industry. Particularly in an immature industry, where burgeoning firms may be undervalued, investors have the rare opportunity to guide the development of a number of pharmaceutical industry sub-sectors, including research, manufacturing, and marketing. In 2007, only 250 firms in China had revenue of at least RMB100 million.[10] That number indicates an industry in need of foreign investment and mergers and acquisitions. That revenue totals are growing each year is a positive sign, but profits remain spread among more than 4,700 small to medium-sized firms. During the past decade, the industry has expanded at a 20 percent annual growth rate.[11] By 2013, sales of patented, generic, and OTC medicine will likely reach US$74 billion.[12]

The strength of the pharmaceutical industry becomes clearer after comparing it relative to the economic risks associated with other industries The toy industry, which this report will recommend against investing in, plunged throughout 2008 and 2009 as a result of safety concerns, rising labor and raw material costs, and the shift of manufacturing to

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[10] Zhou Eliza Yibing, "China Pharma Basking In Its Spotlight," Genetic Engineering and Biotech News, March 1, 2007.
[11] Zhou Eliza Yibing, "China Pharma Basking In Its Spotlight," *Genetic Engineering and Biotech News*, March 1, 2007.
[12] "Eye Care in China," *Euromonitor International*, January 9, 2009.

emerging economies such as Vietnam and Cambodia.[13] The migration in low-skilled manufacturing out of China will continue as Chinese labor laws continue to strengthen and as the government has prioritized establishing certain locales as high-tech industrial centers. This is exhibited through the government's plans to build 100 "innovation bases" across China to focus on researching, developing, and producing capital-intensive products, like pharmaceuticals.[14] Further, while pharmaceutical firms in China are growing, toy manufacturers are shuttering rapidly. Roughly 1,000 toy exporters in Guangdong province alone closed in 2008 amid international fears and sanctions as a result of exporting unsafe products.[15] In one example, the owner of Foshan Lee Der Toys Co., Zhang Shuhong, killed himself after toys his firm manufactured for Mattel were found to contain lead paint. Lee Der closed a short time later.[16]

The toy industry presents the polar opposite to the pharmaceutical industry in terms of investment attractiveness. However, potentially lucrative alternatives to the pharmaceutical industry exist. China's solar power industry is one potential investment alternative; it is an industry likely to experience rapid growth in the near-term, particularly as rising government initiatives to curb pollution spur domestic demand and diminishing oil reserves and subsequent rising prices will create a consistent and reliable demand from states around the world in the years to come. The growth projections for solar power must be viewed through a long-term lens, however. Due to the high capital costs of solar power materials, the lingering effects of a global recession, and the still relatively cheap price of oil, solar power usage around the world is likely to remain level in the near-term. China's largest

[13] Rachelle Jackson, "Wage Rates – China's rising costs make buyers think twice," *Ethical Corporation*, 10 March 2008.
[14] 100 Export-oriented Innovation Bases Planned" *China Daily*, Feb 24, 2006.
[15] Raja Murthy, "India ban worsens China's toy woes" *Asia Times*, Jan. 30 2009.
[16] David Barboza "Scandal and Suicide in China: The Dark Side of Toys," *The New York Times*, August 23, 2007.

solar power panel manufacturer, Suntech Power Holdings, saw its stock drop 50 percent in the first quarter of 2008 amid a soft housing market.[17] However, the company is moving ahead with plans to tap a significant share of the U.S. market by opening a manufacturing plant in Arizona, and its profits have continued to rise as well. Between 2004 and 2008, gross profits rose from US$68.6 million to $342.9 million.[18] While the company's desire to tap the U.S. market might seem dangerous given the U.S.'s resistance so far to adopt comprehensive renewable energy policy, high-volume production and an aggressive expansion plan are what will keep Suntech profitable. Industry barriers to entry are falling around the world, causing a more competitive atmosphere and shrinking profit margins.[19] Falling prices should precipitate a rise in demand – a positive sign for a volume-reliant manufacturer like Suntech.

However, the solar power industry in China faces an inherent risk that the pharmaceutical industry does not. Unlike in pharmaceuticals, where a government initiative to boost the availability of medicines virtually guarantees a rise in demand for manufacturers, efforts by the Chinese government to curb emissions will likely not bring on an equally concentrated increase in demand because numerous viable alternatives to solar power exist under the larger umbrella of renewable energy in China. Benefits from a favorable government policy are likely to be shared among companies in the solar power, hydroelectric, and wind power industries, among others. Regardless of the industry, this is a necessary consideration in China: Investors should pinpoint industries poised to benefit from favorable government policies, that will experience a steadily growing demand, and do not

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[17] Adam Aston, "China Solar Panel Maker Sets First U.S. Plant," *Businessweek*, Nov. 15, 2009.
[18] Suntech Power. "2008 Annual Report 20-F." *Suntech Investor Center*. Sept. 2009. Web. 8 Oct. 2009.
[19] MichaelGriffin and Kim Tang, "Solar Energy Sector Shines Through Recent Decline," October 12, 2009.

receive considerable competition from viable substitute products. Unlike in the solar power industry, the pharmaceutical industry's greatest competition is among the individual companies involved. Traditional Chinese medicine and synthetic pharmaceuticals are the most closely competing industries, yet they are not locked in direct competition as in renewable energy industries since they often cater to different demographic groups. In addition, government efforts to reform health care in China seem to support the growth of both pharmaceuticals and TCMs, and have included both in the national list of government subsidized medicine.[20] For these reasons, it appears pharmaceuticals will be a safer and more lucrative investment.

Policy Risks

An investor examining any industry in China today must consider how the scope and implementation of a growing number of business-regulation policies will impact their ultimate goals. Particularly where mergers and acquisitions are integral parts of an investor's industry growth strategy, issues including China's new antitrust regulations emerge as a potential roadblock to success. In addition, several other policy risks must be recognized and mitigated when investing in the pharmaceutical industry, including weak IPR protection, government techno-nationalist tendencies, and an inability by local agencies to rein in counterfeit pharmaceutical manufacturing, which has threatened to taint the reputation of Chinese manufactures hoping to distribute internationally. While each of these cases is unique and will be examined individually, a common mode to lessening these risks emerges: An investor in China's pharmaceutical industry must present a plan to regulators that suggests foreign capitalization will help the overhaul health of the industry. Regardless of an

[20] "China's health care reform aims at public interest, Premiere Wen says," *Xinhua*, February 28, 2009.

investor's obvious moneymaking ulterior motive, regulators must be convinced that an investor's interests are aligned with the state's larger economic growth strategy.

To begin, consider the use of China's antitrust law as one of the greatest risks facing an M&A-focused pharmaceutical investor. Since the law's implementation in 2008, it has been scrutinized for possible political biases against foreigners. Two main issues surround the implementation of the antitrust law so far. The first set of issues stems from the law itself. The law's text is ambiguous in several areas and leaves the door open to a politicization of the process. The law never defines, for example, at what point industry concentration creates unfair competition, nor does it define "social and public interest," a term used in Article 28 of the AML.[21]

In addition to the law's ambiguous language, its implementation has also raised questions among foreign investors. In the best-known case involving the antitrust law to date, Ministry of Commerce (MOFCOM) officials rejected a plan by Coca-Cola to purchase Huiyuan, one of China's largest fruit juice manufacturers. In a particularly worrying decision for foreign investors, MOFCOM decided the merger would make it too difficult for small and medium-sized domestic firms to survive.[22] In another example, MOFCOM placed significant restrictions when approving the sale of Anheuser-Busch to InBev last year.[23] This pharmaceutical industry investment plans looks to lessen this risk by developing joint ventures with domestic pharmaceutical firms. While investors will work actively to influence and shape the growth plans of an invested company, government policy brokering will be left to a firm's Chinese nationals. Under this investment strategy, firms will be expected to begin

[21] Michael Bachrack, Cunzhen Huang and Jay Modrall, "Merger Control under China's Antimonopoly Law: The First Year," *China Business Review*, July-August 2009.
[22] Andrew Baston, "China's Statement Blocking Coca-Cola Huiyuan Deal," *The Wall Street Journal*, March 18, 2009
[23] Michael Bachrack, Cunzhen Huang and Jay Modrall Merger Control under China's Antimonopoly Law: The First Year *China Business Review*, July-August 2009.

the process of mergers and acquisitions to secure a larger market share. Court decisions so far with regard to antitrust law appear to have discriminated against wholly foreign-owned enterprises but not necessarily against joint ventures.

In a related risk to government protectionism, techno-natioalism has been associated with China since gradual liberalization began 30 years ago and is a risk that accompanies a number of technology-driven industries, particularly those in which the West has maintained a historical stronghold. The establishment of new technical standards on electronic goods is a common way in which China has demonstrated techno-nationalism. Western firms have complained that these new technical standards hinder innovation, yet in many cases, the Chinese have demonstrated an unwillingness to budge. A leading think-tank called these practices part of China's "new globalism," a way in which the East could challenge the West's traditional technological monopoly.[24] This mainstream rhetoric should worry investors considering high-tech industries where international technical standards are a building block for success. It appears the central government is determined to support its own companies irrespective of foreign investors' demands.[25] With time, as China's technical capacities increase, the country is expected to rely less on irregular technical standards to spur growth. [26] However, there is no indication nationalistic practices will not continue, and as a result, investors should consider establishing joint ventures, which are often able to escape discriminatory measures taken against some investors of wholly foreign-owned enterprises.

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[24] Yu Zhou, "State and Commercial Enterprises in China's Technical Standard Strategies," *China Week*, Spring 2006, pp. 45.
[25] Yu Zhou, "State and Commercial Enterprises in China's Technical Standard Strategies," *China Week*, pp.50.
[26] Scott Kennedy, "The Political Economy of Standards Coalitions: Explaining China's Involvement in High-Tech Standards Wars," *Asia Policy*, July 2006, pp.60.

Along with considering issues of techno-globalism, it is necessary to consider the weakness of IPR in China and how that will impact a burgeoning pharmaceutical sector. Relative to techno-globalism, issues related to IPR are severe in China. As with techno-nationalism considerations, the pharmaceutical industry will benefit by not relying on a single infusion of knowledge to develop products. In addition, unlike in the software industry, for example, counterfeit drugs are often difficult and expensive to produce, and the State Food and Drug Administration has begun to crack down on counterfeit drug manufacturers as a result of international reputation tarnishing due to dangerous counterfeit pharmaceuticals.[27] Ultimately local authorities will need to take the lead in eradicating counterfeit drugs and thus investors must spend time and money lobbying local drug regulators to crack down more aggressively on illegal manufacturers. This investment plan ultimately seeks to sell pharmaceuticals abroad, but the product's quality reputation must first improve to win the trust of overseas governments. The recent approval by the U.S. FDA for Zhejiang Huahuai pharmaceuticals to sell one drug in the U.S. is an encouraging sign, and a further locally led crackdown on illegal manufacturers will only bolster that movement.

Political Risks

While investors considering every industry in China face a number of political risks, a pharmaceutical industry investment plan is particularly susceptible to risks like local protectionism, government cronyism, limited government transparency, and a weak judicial system, while at the same time less likely to face particular danger from ever-present issues like labor unrest and mass movements. These types of risks are severely threatening a firm's stability vis-à-vis the state. As Lee notes, mass labor movements are a part of the "livelihood

[27] "Status Quo of Drug Supervision in China," *Information Office of the State Council of the People's Republic of China,* July 2008.

struggle" to emerge for uneducated workers in the wake of liberal reform.[28] Any investor in China, irrespective of industry, must weigh how political volatilities, labor protests, and the constant tug of an emerging civil society could put their investments at risk. Unlike in clothing manufacturing, for example, where mass labor protests have brought unease to foreign investors, risks facing various sub-sectors of the pharmaceutical industry hinge on the government's ability to rein in corruption at the local government level and eliminate counterfeit pharmaceuticals.

The greatest risk facing pharmaceutical-industry investors today is local government cronyism, and its inability so far to crack down on unregulated and potentially dangerous products. Local SFDA officials say the problem stems from a discrepancy between the cost of genuine pharmaceuticals and counterfeit medicine. In addition, a regulatory loophole has caused many drugs to go entirely unchecked.[29] That loophole, which exists despite the international attention given to it, allows pharmaceuticals produced by officially registered chemical companies to sustain no oversight and testing from the SFDA. In other words, the pharmaceuticals manufactured by chemical companies are sold to the international market without SFDA approval. While Chinese health care reform will invariably help to close the cost gap between genuine and counterfeit drugs, a unified lobbying front against the existing regulatory loophole could help to ease that risk as well. Even lobbying presents political challenges, however, and as Kennedy notes that among various industry advocacy associations, "…the general atmosphere of close government oversight is still widespread.[30] Joint ventures would have the option of joining national or local industry associations.

[28] Chin Kwan Lee, "Labor Protests in China's Rustbelt and Sunbelt," *University of California Press*, 2007, pp. 23.
[29] Walt Bogdanich, Jake Hooker and Andrew W. Lehren, "Chinese Chemicals Flow Unchecked Onto World Drug Market," *The New York Times*, Oct. 31 2007.
[30] Scott Kennedy, *The Business of Lobbying in China* (Harvard University Press, 2005) pp. 40.

However, these association appear to be either state-administered or under close watch by the state. For example, the nationwide China Pharmaceutical Industry Association describes itself as a "non-governmental, non-profit association," yet its honorary chairman, Sang Guowei, is vice-chairman of the NPC.[31] In a local example, the Shanghai Pudong Bio Industry Association is directly administered and controlled by local authorities. Despite the potential for state manipulation of lobbying efforts, the chances of ending this loophole are more likely be successful as the outcome ultimately aligns with China's goal of improving pharmaceutical safety.

The government's coming purchase of massive quantities of pharmaceuticals as a result of health care reform presents an opportunity for drug manufacturers to grow. However, it also presents a chance for government cronyism, especially at the local levels, to hurt foreign investors. As these governments decide which manufacturers to purchase from, *guanxi* will almost certainly play a role. While *guanxi* itself is not a corrupt practice, its use can presuppose corruption. The practice of using personal relations to steer business has been described as resulting from a weak legal system.[32] In the case of health care reform, a firm will ultimately have to use it as part of its government contract-bidding strategy and it will be particularly important for a company invested with foreign capital. In a fiercely competitive system where government transparency is virtually non-existent, the use of *guanxi* by joint venture managers and local Chinese staff will help to ensure undue discrimination is not placed on firm with foreign capital supporting it.

While China's legal system has developed significantly since reform began 30 years ago, the impact of politics on the judicial system remains high. Particularly worrying for a

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[31] "Introduction to Leading Group," *China Pharmaceutical Industry Association*. http://www.cpia.org.cn/en/company_e_ldrjs.asp

[32] Scott D. Seligman, "Guanxi: Grease for the Wheels of China," *The China Business Review,* September-October 1999.

foreign investor, judges are often expected to consult party chiefs before handing down a decision.[33] This judicial politicization relates to risks presented by a lack of transparency in both the courts and civil service. Unlike in low-skilled manufacturing industries, every new pharmaceutical product is subject to rigorous SFDA testing and scrutiny. In much the same way that courts could unfairly use the antitrust law against foreign companies, a lack of transparency at the SFDA will cause investors to worry the government will use political motives to hinder the development of their products. However, this is a risk easily weighed against the potential for tapping a 1.4 billion-person market. Legal formalism in China and the power of the SFDA to regulate drugmakers are both improving, but as long as China maintains its one-party authoritarianism, certain key political risks will remain. However, it appears a dose of *guanxi* and the lobbying of local officials can mitigate risks in the pharmaceutical industry. Unlike many industries perpetually in danger of the threat of labor unrest, pharmaceutical industry employees tend to be smaller in number and better treated. The most inherent risks politically stem from invariably opaque political and judicial systems. These are risks that threaten to make business maneuvers more challenging, but do not threaten to crumble an operation completely, unlike the risks posed by severe labor unrest.

<u>Action Plan</u>

With $1 billion to invest, it will be important to diversify investments across a number of pharmaceutical industry sub-sectors. These are divided into three categories: traditional research-oriented pharmaceutical firms, generic drug manufacturers, and contract research organizations. Partitions between these industries are not always clear, and an effective investment plan will gain stakes in the major players of all three. If one of these

[33] Jerome A. Cohen, "China's Reform Era Legal Odyssey" *Far Eastern Economic Review*, December 2008, pp. 34.

entwined industries is able to thrive, the residual impacts on the other two will likely be positive. For example, if Chinese research firms have a number of drugs in various-stage development, the prospects for specialty CRO testing firms will rise.

It is important to recognize that the pharmaceutical industry remains an immature one. No Chinese firm ranks among the top 20 in annual revenue, and while the industry in China has witnessed double-digit growth each year over the past decade, it remains largely the manufacturer for foreign ingenuity.[34] A lack of collaboration between enterprises and scant foreign investment so far are the biggest inhibitors to growth.[35] China is not inventing its own drugs at any significant rate and has largely been relegated as a manufacturer of patent-expired medicines. While the ultimate goal of this investment will be to foster the growth of original research, initially it will focus on goals related to an already-strong generic industry. Immediate goals include fostering a merging of several leading generic manufacturers, improving drug-quality standards and efficiency of production, and fostering an international network of clients.

In the early stages of investment, establishing joint ventures with two of China's top generic manufactures, Shanghai Pharmaceutical and Jiuzhoutong Group, will be critical. While the firms are among China's largest pharmaceutical firms, they comprise less than 5 percent of the market and exhibit the intensely competitive and disorganized nature of China's pharmaceutical industry.[36] The immediate goal of establishing joint ventures with Shanghai Pharmaceutical and Jiuzhoutong Group is to increase generic production efficiency, drive down the price floor, and win government contracts as part of national health care

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[34] Gil Y. Roth, "Top 20 Pharmaceutical Companies Report," *Contract Pharma*. http://www.contractpharma.com/articles/2008/07/2008-top-20-pharmaceutical-companies-report
[35] "China Pharmaceutical Industry Report 2007-2008," *Research and Markets*.
[36] "China Pharmaceutical Industry Report 2007-2008," *Research and Markets*.

reform. A significant amount of capital will be used to modernize production equipment at these plants to international standards and expand production capacity to anticipate a growing international demand. By selling low-cost generic drugs, it will be necessary to continually expand sales volume. Beyond immediate goals of tapping the domestic market, which is expected to grow from the ninth to sixth-largest drug market in the world by 2011, it will be necessary to grow sales abroad. In Phase II of investment, these joint ventures will seek to sell more drugs abroad, particularly to the developing world. Markets in Africa, for example, will be particularly open to buying Chinese-manufactured drugs. An intense public relations campaign will accompany the increase in sales to the developing world. This move will be framed in terms of corporate social responsibility and will seek to boost the joint venture's international standing. In Phase III of investment, following a complete upgrade in production equipment, the joint venture would lobby in the United States government for sales to begin in the U.S. Having secured a dominant position in the Chinese market and various markets abroad during Phases I and II, the reliable reputation the joint venture established should help to ease concerns among U.S. lawmakers. The ultimate goal is to establish the joint venture as a global producer of safe, affordable generic medicine. A summary of investment of this part of the action plan is as follows:

I. $150 million each will be contributed to Shanghai Pharmaceutical and Jiuzhoutong Group, designated to modernize equipment and increase production capacity.

II. Phase I of the plan will involve lobbying officials in various locales as to why the joint venture's medicines are best-suited to be included as part of national health care reform. The venture's coming high volume of production will make it possible to produce drugs cheapest – no doubt the greatest convincing factor for local officials.

III. Expand sales to the developing world, with a particular focus on states with which the Central Government has built strong relations.

IV. Focus an intense lobbying campaign on the U.S. government to allow the importing of Chinese-produced generic drugs. Building a reputation for safety during Phases I-III will be key for the success of Phase IV.

If the ultimate goal is to increase collaboration and consolidation within the pharmaceutical industry, investment in cutting-edge research will also be critical. This research will initially be centered in eastern China, where high-tech infrastructure is most developed, but long-term projections will seek to expand research operations both to western and eventually overseas.

Compared with generic producers, this is a riskier investment but could yield significant rewards in the long-term. In addition, investing in research is more capital-intensive than modernizing production equipment. It will be important to entice foreign-educated researchers back to China with competitive packages. In addition, it will be important to invest in companies that have already proven themselves capable to succeed in overseas markets. For that reason Zhejiang Huahai Pharmaceutical will become a key partner in the research and development of new medicines. Zhejiang Huahai's prospects are particularly encouraging because its newest HIV medication, Nevirapine, was approved by the FDA in 2007 and selected as part of the President's Emergency Plan for AIDS Relief.[37] An investment of $200 million will virtually double the firm's estimated worth, and provides

[37] "President's Emergency Plan for AIDS Relief" *Food and Drug Administration.* November 24, 2009. www.fda.gov/internationalprograms/fdabeyondourbordersforeignoffices/asiaandafrica/ucm119231.htm

the investors with an influential share of the company.[38] Roughly half of this money will be used to expand research capacities, both in China and in the United States, while the other half will be used to recruit the world's best researchers. To staff research operations in China, the joint venture will seek to hire growing numbers of scientists educated abroad. Invested capital will help pay top scientists the wages other research firms cannot.

Along with Zhejiang Huahai, $300 million will be invested in Harbin Pharmaceutical Group Co., Ltd. Like Zhejiang Huahai, Harbin Pharmaceutical has experienced consistent growth in recent years: Each year the company has applied for a further RMB500 million credit line as revenues rise.[39] In September, the company reported that profits rose 4 percent over the previous year to $800 million.[40]

Further, the investment strategy will remain consistent with Harbin Pharmaceutical, with a long-term goal of merging its operations with Zhejiang Huahai's. While the company today manufacturers both generic and patented drugs, after investment it would focus on expanding the research, development, and marketing of only newly patented drugs. It will be important for established joint ventures, like Harbin Pharmaceutical, to focus on a specific area of manufacturing and then work to collaborate with partner joint ventures.

The third component of this investment plan will invest the remaining $300 million to establish a joint venture with Wuxi Pharmatech, a leading CRO. This firm will seek to compete with leading U.S. CROs like Covance and Parexel by using the cheaper cost of labor in China to offer multinational pharmaceutical firms a less expensive contract research

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[38] "About Us," *Zhejiang Huahai* company Web site. http://en.huahaipharm.com/content.asp?info_kind=001002

[39] "Harbin Pharmaceutical Group Co., Ltd. to Apply for Comprehensive Credit Line," *Reuters Key Developments*, October 30, 2009. http://www.reuters.com/finance/stocks/keyDevelopments?rpc=66&symbol=600664.SS&timestamp=20091031000000

[40] Cindy Wu, "Harbin Pharmaceutical Group reports H1 net profits up," *Asia Manufacturing,* September 16, 2009.

option. While in the near-term business established with Wuxi will be with international firms – due to the fact that most pharmaceutical research is not being done in China – the long-term will see a rise in business partnerships between Wuxi and domestic research firms. Specifically, new partnerships will form between Wuxi and Zhejiang Huahai and Harbin Pharmaceutical. This increased collaboration between some of the newly established joint ventures will help assert dominance across the sub-sectors of the pharmaceutical industry. Each investment will help the other and will look to undercut fierce, yet disorganized, competition.

Despite an array of political and economic risks associated with China, its economy will continue to grow for the foreseeable future. There is little doubt that as Chinese citizens are better educated and attain greater purchasing power, the demand for quality medicines in China will rise. Further, the government's commitment to bolstering the accessibility of pharmaceuticals for all citizens is a positive sign for domestic Chinese firms. While quality issues have hampered Chinese firms previously, establishing powerful joint ventures with the goal of modernizing production of patented and generic drugs will serve to redefine drug-making in China. Joint ventures' mix of Western quality standards and sense of competition combined with Chinese executives knowledge of the domestic market and *guanxi* with officials at all levels of government will allow this venture to thrive and achieve its greater goal of consolidating a presently incongruent industry.