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Accession to WTO and foreign pharmaceutical firms' business opportunities

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AN OVERVIEW

China is now one of the largest pharmaceuticals producers in the world. During the reform period in the late 1970s, when Chinese authorities began economic reforms, the Chinese pharmaceutical industry has grown rapidly. The output of chemical raw medicines rose from 40.7 thousand tonnes in 1978 to 762.2 thousand tonnes in 2001 (Figure 16.1). The output of lactams and vitamins accounts for about 30 per cent of the total world output. China has become the second largest producer of chemical raw medicines in the world. Over the same period, the output of traditional Chinese medicines increased sharply from 87 thousand tonnes to 655.9 thousand tonnes (Figure 16.1).

China's pharmaceutical industry is made up of five sub-sectors (Table 16.1)—

- chemical raw medicines
- chemical pharmaceutical preparations
- traditional Chinese medicine and medicinal materials
- animal medicines
- biological products.

The role of the pharmaceutical industry in the Chinese economy has been growing. In 2001, the value of its output reached 204 billion yuan. From 1978–2001, the output value of the industry increased at an annual rate of 16.7 per cent—well

above the total of all industries, at 11.4 per cent. This industry's profitability was also higher than that of total industry (Figure 16.2).

Chinese authorities permitted Sino-foreign equity joint ventures from 1979, wholly foreign-owned enterprises from 1986, and Sino-foreign contractual joint ventures since 1988. Since the first foreign-funded pharmacy enterprise was set up in 1980, 568 foreign-funded enterprises with sales revenue over 5 million yuan have entered the market. Fifty multinational pharmaceutical firms with advanced productive capacity have established foreign-funded enterprises in China. At present, sales from foreign-funded enterprises account for 22.2 per cent of the total in the Chinese domestic market. By 2001, the accumulated foreign capital invested in the industry reached a total of 9.5 billion yuan with capital from Hong Kong, Macao, and Taiwan reaching 4.8 billion yuan, and contributed 11.7 per cent and 6.0 per cent respectively to the total capital investment in the industry. Direct investment from foreign countries

Figure 16.1 Output of chemical raw medicines and traditional Chinese medicines

Sources: China State Statistical Bureau, *China Statistical Yearbook*, 1986–2002 Beijing, China Statistical Publishing House.

Figure 16.2 Growth rates of net asset profits and output value, pharmaceutical and total industry, 1991–2001

Sources: China State Statistical Bureau, various years, *China Statistical Yearbook* and *China Industrial Economy Statistical Yearbook*, China Statistical Publishing House, Beijing.

including Hong Kong, Macao and Taiwan have played an important role in the development of the Chinese pharmaceutical industry.

Official statistics show that since 1992 exports have exceeded imports of Chinese medicines continuously, and China has become a net exporter of medicines (Figure 16.3). During 1992–95, the export value of medicines rose sharply, growing at an annual average rate of 20.1 per cent. In contrast, the import value of medicines fell by 14.4 per cent. Since 1997, however, the import value of medicines has increased rapidly, growing at an annual average rate of 38.5 per cent.

Although the Chinese pharmaceutical industry as a whole has been growing rapidly, small-scale industries that are widely dispersed are the main characteristics of Chinese pharmaceutical enterprises. At present, there are 3,488 pharmaceutical

Table 16.1 Structure of the Chinese pharmaceutical industry in 2000

Sub-sector	Number of enterprises	Output value (RMB bn yuan)	sub-sectoral output value/ total output value (per cent)	Sales revenue (RMB bn yuan)	Sub-sectoral sales revenue/ total sales revenue (per cent)
Chemical raw medicine	685	50.7	28.4	49.5	30.4
Chemical pharmaceutical preparation	934	57.0	32.0	50.5	31.0
Traditional Chinese medicine and medicinal material	1180	53.3	29.9	48.2	29.6
Animal medicine	231	3.5	1.9	3.2	1.9
Biological product	271	13.5	7.6	11.2	6.8
Total	3301	178.1	100	162.7	100

Source: State Statistical Bureau, 2000. *China Industry Statistical Yearbook 2000*, China Statistical Publishing House, Beijing

producers, with only 820 (23 per cent) are classified as large or medium-sized. The sales value by the biggest 60 pharmaceutical enterprises contributes only 35.7 per cent to total sales of this industry. In contrast, the sales value by the biggest 20 multinational pharmaceutical firms in the world produced more than 60 per cent of total sales in the international pharmaceutical market. This comparison shows that the market concentration of Chinese pharmaceutical enterprises is very low.

Duplicated production and lack of autonomic patented products are further characteristics of the industry. For example, generic drugs, gentamycin, vitamin B1, p-acetaminophemol (paracetamol) and metronidazole are being reproduced in hundreds of factories. New pharmaceuticals, levofloxacin and clarithromycin are also being reproduced in over 30 pharmaceutical factories. Numerous pharmaceutical enterprises are pursuing exorbitant short-term profits rather than long-term interests. Only half of the large and medium-sized pharmaceutical enterprises have established their own institutes of research and development, and many medium and small-sized pharmacy enterprises have not established their own institutes. It is difficult for institutes and universities to find industrialised cooperative partners to turn their research achievements, patents and inventions into production.

Expenditures for research and development have been below 3 per cent of total sales revenue per year, and less than 7 per cent of all employees in large and medium-sized pharmaceutical enterprises have been engaged in research (Table

Figure 16.3 Imports and exports of Chinese medicines

Source: State Statistical Bureau, various years. *China Statistical Yearbook*, China Statistical Publishing House, Beijing.

16.2). The financial and human resources for research and development are inadequate. Over 1995–2000, Chinese authorities granted new pharmaceutical licenses to 5,043 products, of which 108 were regarded as first class. Even though they were qualified as innovative products, not one was capable of entering the international market. In the field of biological products, over 30 varieties of genetic pharmaceuticals have been permitted by Chinese authorities into the market, of which only Interferon A1b is a Chinese invention.

In the field of traditional Chinese medicine, the 'Gingko pill' and 'Salvia miltiorrhiza pill' have passed the US Federal Drug Administration's (FDA) antecedent examination, and are now in the clinical test stage. The export value of traditional Chinese medicines from China accounted for only 3 per cent of the total sales revenue generated by Chinese medicines on the international market. In the field of

Table 16.2 Research and development expenditures, of large and medium-sized pharmaceutical enterprises

	No. of enterprises	No. of enterprises with own institutes	Researchers/ employees (per cent)	R&D expenditures/ total sales revenue (per cent)
1996	678	466	3.9	1.7
1997	708	408	5.8	1.6
1998	726	406	6.3	1.7
1999	711	418	6.1	1.7
2000	728	411	6.8	2.4
2001	820	410	6.9	2.5

Sources: Calculated from original data obtained from China State Statistical Bureau and Ministry of Science and Technology (eds), 2000. *China Statistical Yearbook on Science and Technology, 1997–2002*, China Statistical Publishing House, Beijing.

chemical medicine, Chinese pharmaceutical enterprises mainly produce cheap imitations. In recent years, 97.4 per cent of the 873 varieties of chemical raw medicines produced by pharmaceutical enterprises were imitations. Chinese pharmaceutical enterprises have limited capabilities in the preparation of pharmaceuticals. In general, they can only prepare three kinds of dosage forms of chemical raw medicine, and the quality of medicaments is unstable. The management structure of Chinese pharmaceutical enterprises is outdated compared with multinational pharmaceutical firms.

INTERNATIONAL TRADING COMPETITIVENESS

Measuring international trading competitiveness

The trading competitiveness of pharmaceutical products can be measured using the international trading competitive index and the price index. The international trading competitiveness index can be calculated using the following formula and definition

$$\text{International trading competitiveness index} = \frac{(\text{export value} - \text{import value})}{(\text{export value} + \text{import value})}$$

International trading competitiveness scores close to 1 indicate high trading competitiveness, and scores closer to zero indicate low trading competitiveness. Where the total international trading competitiveness index of overall products in

particular industry is negative, this industry has a lack of international trading competitiveness, and a deficit of foreign trade occurs.

The price index has the following calculation formula and definition,

$$\text{Price index} = (\text{export value/export volume}) / (\text{import value/import volume})$$

The price index reflects the unit parity of a product in the international market. For a lower cost product, a high price index indicates a higher international trading profit margin and a price competitive advantage for that product. The exporter of this product can reduce the export/import unit parity of the product to support the international trading competitiveness of the product. In other words, an exporter with the lower cost product can sacrifice his price advantage to gain strong international trading competitiveness. When the international trading competitive index and the price index of a product drop continuously at the same time, this means that the international trading competitiveness of the product is weakening continuously. Both the international trading competitiveness index and the price index can be used to reveal the international trading competitiveness of a certain kind of product or industry.

In the chemical raw medicines category, hormones, derivatives and steroids used primarily as hormones (HS No. 2937), vegetable alkaloids and their salts, ethers, esters and other derivatives (HS No.2938), glycosides and their salts, ethers, esters and other derivatives (HS No.2939), chemically pure sugars (except sucrose, lactose, maltose, glucose and fructose), sugar ethers, sugar esters and their salts (HS No.2940) have relatively high international trading competitiveness indices of 0.83–0.95 (Tables 16.3 and 16.4). The results reveal that these chemical raw medicines have strong international trading competitiveness. Nucleic acids and their salts; other heterocyclic compounds (HS No.2934), sulfonamides (HS No.2935), provitamins and vitamins used primarily as vitamins (HS No.2936) and antibiotics (HS No.2941) have international trading competitive indices of 0.47–0.70. These indices have dropped year by year, which shows that these chemical raw medicines have had a certain degree of international trading competitiveness, but this has weakened over time. The international trading competitiveness index of pharmaceutical products (HS No.30) has also fallen over time—pharmaceutical products are gradually losing competitiveness on the international market.

Analysis of the price index reveals that chemical raw medicines that have high international trading competitiveness indices, such as HS No. 2937, 2938, 2939, 2940, have all suffered year by year falls in those indices. This indicates that the

Table 16.3 International trading competitiveness indices of chemical raw medicines and pharmaceutical products, 1995–2000

HS No.	Description	1995	1996	1997	1998	1999	2000
2933	Heterocyclic compounds with nitrogen hetero-atoms	-0.186	0.0101	-0.088	-0.1864	-0.2614	
2934	Nucleic acids and their salts; other heterocyclic compounds	0.5214	0.5339	0.5662	0.3997	0.4783	
2935	Sulfonamides	0.9017	0.9168	0.8864	0.8973	0.8058	0.699
2936	Provitamins and vitamins, derivatives used primarily as vitamins	0.8229	0.8077	0.7349	0.7689	0.7152	0.8312
2937	Hormones, derivatives used primarily as hormones; other steroids used primarily as hormones	0.7411	0.9172	0.9657	0.9727	0.8728	0.9222
2938	Glycosides, and their salts, ethers, esters and other derivatives	0.9807	0.9821	0.9933	0.9817	0.966	0.8584
2939	Vegetable alkaloids, their salts, ethers, esters and other derivatives	0.9692	0.9843	0.9666	0.861	0.9163	0.9057
2940	Sugars, chemically pure, other than sucrose, lactose, maltose, glucose and fructose; sugar ethers, sugar esters and their salts	0.8486	0.9162	0.9563	0.9546	0.9447	0.9528
2941	Antibiotics	0.6355	0.7973	0.8013	0.6319	0.5802	0.6421
30	Pharmaceutical products	0.4184	0.383	0.4466	0.2837	-0.0038	-0.0879
	Chemical raw medicines and pharmaceutical products	0.4821	0.4851	0.5309	0.4249	0.2707	0.2142

Notes: The data in *China Customs Statistical Yearbook* are classified in accordance with the HS Number, the data in *China Statistical Yearbook* are classified in accordance with the SITC, so the coverage of HS No.30 (Pharmaceutical Product) is not in accord with the Export and Import Trade of Medicines in the *China Statistical Yearbook*.

Sources: Calculated from original data from State Customs General Administration, various years. *China Customs Statistical Yearbook*, China Customs Publishing House, Beijing.

Table 16.4 Price indices of chemical raw medicines and pharmaceutical products, 1995–2000

HS No.	Description	1995	1996	1997	1998	1999	2000
2933	Heterocyclic compounds with nitrogen hetero-atoms		2.707	2.4677	2.1783	2.2611	1.6496
2934	Nucleic acids and their salts; other heterocyclic compounds		0.6377	0.9663	1.3431	0.3816	0.3796
2935	Sulfonamides	7.8154	6.8834	12.8432	7.4463	0.4757	0.2612
2936	Provitamins and vitamins, derivatives used primarily as vitamins	1.4341	0.5734	0.6889	0.5302	0.333	0.5698
2937	Hormones, derivatives used primarily as hormones; other steroids used primarily as hormones	0.5505	2.6574	4.7199	0.7828	0.2191	0.1962
2938	Glycosides, their salts, ethers, esters and other derivatives	22.3226	1.3728	3.3279	1.5673	0.5985	0.5196
2939	Vegetable alkaloids, their salts, ethers, esters and other derivatives	1.016	1.043	0.4357	0.2507	0.3785	0.1856
2940	Sugars, chemically pure, other than sucrose, lactose, maltose, glucose and fructose; sugar ethers, sugar esters and their salts	3.6304	4.1796	0.4066	0.4402	0.9684	1.6450
2941	Antibiotics	0.3222	0.7157	0.4676	0.2025	0.0657	0.2055
30	Pharmaceutical products	0.3986	0.4317	0.4665	0.3393	0.2187	0.2114
	Chemical raw medicines and pharmaceutical products	2.4077	2.6738	2.5581	2.1654	1.5686	1.4513

Notes: The data in the *China Customs Statistical Yearbook* are classified in accordance with the HS Number, the data in the *China Statistical Yearbook* are classified in accordance with the SITC, so the coverage of HS No.30 (Pharmaceutical Product) is not in accord with the Export and Import Trade of Medicines in the *China Statistical Yearbook*.

Sources: Calculated from original data from State Customs General Administration, various years. *China Customs Statistical Yearbook*, China Customs Publishing House, Beijing.

strong international trading competitiveness of chemical raw medicines is being supported at the expense of their price advantage. Chemical raw medicines such as HS No. 2934, 2935, 2936, 2941, have also experienced falling price indices, which reflects diminishing price advantages as well as declining international trading competitiveness. Pharmaceutical products (HS No.30) have been losing both international trading competitiveness and price advantage. So far, the total price index of chemical raw medicines and pharmaceutical products is still higher than 1, though it has dropped year by year. If the international trading competitiveness indices are compared with the price indices, the following conclusion can be drawn: the Chinese pharmaceutical industry's competitive advantage in international trade is gradually weakening.

POTENTIAL TRADING COMPETITIVENESS

Potential trading competitiveness depends mainly on an industry's innovative ability. The number of patents is a crucial indicator of the innovation of the pharmaceutical industry. According to International Patent Classification (IPC), patents related to the pharmaceutical industry are mainly in the categories of Medicine A61K and its subgroups—Chemical Medicine A61K31, Traditional Chinese Medicine A61K35 and Pharmaceuticals A61K9. Table 16.5 is an analysis of medicine patent applications, and Figure 16.4 presents the ratio of patents for Chinese medicine applications granted to Chinese and to foreign applicants.

In traditional Chinese medicine, the proportion of patents granted to foreign applicants reached its highest level in 1994 (10 per cent). Since then the proportion has been very low (Table 16.5 and Figure 16.4). In 1999 and 2000, the proportions granted to foreign applicants for traditional Chinese medicine was only 0.8 per cent and 0.5 per cent respectively. China has a strong innovative ability in traditional Chinese medicines. In chemical medicines, foreign applicants dominate, not only in amount of applications but also in the proportion granted. Although the proportion granted dropped after 1992, it remained at about 60 per cent from 1997 to 2000. In the field of chemical medicines, Chinese producers have lower capability for innovation compared with foreign producers. In recent years, 97.4 per cent of chemical raw medicines produced by Chinese pharmaceutical enterprises have been imitations of foreign products.

Figure 16.4 Medicine patents in China: proportion granted to foreign applicants (per cent)

BUSINESS OPPORTUNITIES FOR FOREIGN PHARMACEUTICAL FIRMS IN CHINA

What factors bring business opportunities to foreign pharmaceutical firms in China? How do these factors affect such opportunities?

Chinese authorities' commitments and administrative measures

China became a member of the WTO on 11 December 2001. According to the WTO Agreement, Chinese authorities made commitments about national treatment, market access and the most-favoured nation tariffs as follows.

- Within three years of China's accession to the WTO, foreign services suppliers will be permitted to engage in the distribution of pharmaceuticals (see Annex 9–Schedule of Specific Commitments on Service of Protocol on the Accession of the People's Republic of China).
- Within three years of China's accession to the WTO, the applied average tariff rate of imported pharmaceuticals will be reduced by 5–6 per cent (see Annex 8–Schedule CLII" of the Protocol on Accession).

Table 16.5 Number of patent applications in the field of medicine, 1990–2000

IPC Group	Content	Total	Domestic applicants		Foreign applicants	
			Number	Per cent of total	Number	Per cent of total
A61K35	Traditional Chinese medicine	10850	10631	97.98	219	2.02
A61K31	Chemical medicine	2703	829	30.67	1874	69.33
A61K9	Pharmaceuticals	1000	367	36.70	633	63.30

Source: State Intellectual Property Office, 2000. *Annual Report 2000*, Intellectual Property Publishing House, Beijing.

After accession to the WTO, Chinese authorities were to adopt a number of administrative measures.

- Pharmaceuticals subject to state pricing covered HS numbers 30011000 to 30066000, including substances of human or animal origin, heparin and its salts, antisera, other blood fractions and modified immunological products, vaccines, toxins, human and animal blood products, penicillins, cephamycines, insulins, adrenal cortical hormones, quinine or its salts, alkaloids or their derivatives, vitamins, sulpha drugs, biphenyl dicarboxybenzoate, contraceptives, and traditional Chinese medicines.
- Based on the principles of the Sanitary and Phytosanitary Agreement (SPS Agreement) and national treatment, Chinese authorities can implement registration of initial imports of pharmaceuticals according to the Pharmaceutical Management Law of the People's Republic of China. The authorities may also implement GMP and GSP certification for foreign funded pharmacy firms and business distributors according to Chinese GMP and GSP regulations.

In addition, China became a member of the World Intellectual Property Organization in 1980, and the Paris Convention for the Protection of Industrial Property in 1985. Chinese authorities revised their Patent Law in 1992 and 2000 to fulfil the requirements of the TRIPS (Trade-related Intellectual Property) Agreement. Since the enforcement of the first amendment of Patent Law in 1993, pharmaceutical patents granted by members of the Paris Convention from 1986 to 1992 were provided administrative protection with conditionality. Since accession to the WTO, Chinese authorities must implement the new conditions of patent law in full compliance with the TRIPS Agreement, and Chinese pharmaceutical enterprises will no longer be allowed to replicate patented pharmaceuticals while they are still under the protection of foreign

patents. This will have detrimental effects not only on pharmaceutical enterprises that were producing imitations of patented pharmaceuticals, but also on business opportunities for foreign pharmaceutical firms in China.

Consumer demand for pharmaceutical products

Consumer demand for pharmaceuticals in China is very large. It is estimated that consumer demand for pharmaceuticals will reach 336 billion yuan by 2005, 1.7 times more than in 2001.

A series of factors underlie such a huge increase in demand.

- China has the largest population in the world. The population will reach 1.33 billion by 2005.
- The pace of urbanisation is accelerating. In 2001, China had an urban population of 0.48 billion. Since 1995 the annual growth rate of the urban population has remained at around 5.3 per cent, indicating that the urban population will rise to 0.59 billion by 2005. The demand of an urban person for pharmaceuticals is seven times higher than that of a rural person. The rapid expansion of the urban population therefore promotes the demand for pharmaceuticals
- the Chinese population is aging rapidly. Based on the census statistics, the population over 65 was 8.8 million in 2000, accounting for 7 per cent of the total population. It is estimated that the annual growth rate of people over 65 will be 3 per cent in the foreseeable future, and the aged population will be over 0.1 billion by 2005. The sharp growth of the aged population will raise consumer demand for pharmaceuticals.

Factors promoting business opportunities

The main factors opening up business opportunities for foreign pharmaceutical firms in China are

- a vast consumer demand for pharmaceuticals
- the fiscal decentralisation being implemented by the Chinese authorities under the control of the central government. Such a regime enables local governments to share more of the tax revenue. Granting local governments a bigger stake in the prosperity of the local economy provides an impetus to stimulate the growth of the local economy. Local governments are to establish special economic zones and adopt preferential policies and flexible measures that are attractive to overseas investors.

- relatively low labour costs. The average worker earns only one-thirtieth to one-fortieth of the average wage in industrial countries
- commitments by the Chinese authorities to reduce the average applied tariff rate on imported pharmaceuticals by 5–6 per cent within three years of accession to the WTO. Under this commitment, foreign service suppliers will also be permitted to engage in the distribution of pharmaceuticals
- suspension of the replication of patented pharmaceuticals by traditional pharmaceutical enterprises, in accordance with China's intellectual property protection commitments. A vast market will be opened for foreign pharmaceutical firms holding autonomic patented pharmaceuticals
- the structure of Chinese pharmaceutical enterprises. Chinese pharmaceutical enterprises are characteristically small scale and have scattered layout, poor preparation capability, outdated management structure, low market concentration and a lack of autonomic patented products. Competitive pressure on state-owned pharmacy enterprises is pushing many of them towards bankruptcy. Currently, privatisation of state-owned enterprises is accelerating. Most await purchase, merger or restructure
- the diminishing trade competitiveness of the Chinese pharmaceutical industry. Although the industry has a certain degree of competitive advantage in price, its international trading competitiveness is seriously diminishing.

Business opportunities

Foreign pharmaceutical manufacturers can capture good business opportunities by establishing wholly foreign-owned pharmaceutical factories and producing pharmaceuticals with autonomic patent rights. However, this requires a large initial investment and further costs to open up the market. Another way is to purchase and merge existing pharmaceutical enterprises, and to produce autonomic patented pharmaceuticals. At present, local governments are selling and auctioning state-owned enterprises within their jurisdiction. Depending on foreign enterprises' bargaining power with local governments, merger and acquisitions could be a lower-cost strategy for entering the market.

Setting up a wholly foreign-owned pharmaceutical company or a distributing network is an efficient way to enter the market. This strategy, however, requires large investments, bears a high cost for the developing market and has certain risks. There are still uncertainties about permission for foreign service suppliers to engage

in distribution of pharmaceuticals. To purchase and merge existing pharmaceutical companies and restructure them with an advanced management structure would be another low cost way to enter the pharmaceutical market.

Profitable fields

What would be a profitable field for a foreign pharmaceutical firm to invest in? Currently there are shortages of special intermediates for preparing pharmaceuticals, such as 6-aminopenicillanic acid (6-APA), 7-aminocephalosporanic acid (7-ACA), 7-aminodeacetoxycefanoic acid (7-ADCA), isophytol and trimethylhydroquinone. The production of these intermediates would be profitable.

The current technologies associated with fermentation, separation and extraction of special intermediates for preparing β -lactams, vitamins, aminoglycosides and macrolides are outdated, so another profitable strategy would be to use DNA recombination or protoplasm hybridisation to breed new species of fungi to improve intermediate fermentation, and use the advanced technologies of ultracritical extraction, macroaperture resin separation and membrane separation to improve intermediate extraction and separation.

Current technologies for pharmaceutical preparation are also outdated. The production of new sustained-release and controlled-release medicaments, as well as targeting and transdermal delivery of medicaments, would also be profitable.

The production of biopharmaceuticals is just beginning, so the biopharmaceutical production of antisera, other blood fractions and modified immunological products, vaccines, toxins prepared for diagnostics, prophylactics, therapeutics for malignant tumours and for cardiovascular and cerebrovascular diseases, diseases of the central nervous system, respiratory system, digestive system, and for AIDS and other immunodeficiency diseases would be highly profitable.

China has abundant resources for preparing natural pharmaceuticals. There are 12,807 species of plants, minerals and animals. However, the techniques for preparing natural pharmaceuticals are primitive. Using the advanced techniques of extraction, purification and separation to produce natural pharmaceuticals would be very profitable.

CONCLUDING REMARKS

Accession to the WTO has further integrated the Chinese economy into the global economic system, with an accelerated pace of industrial restructuring and increased business opportunities for foreign pharmaceutical firms now appearing in China. In

order to explore and capture these opportunities, and to enter more profitable fields, foreign firms need to pay attention in number of factors.

- Although China has formally become a member of WTO, the administrative measures adopted by governments are still not fully transparent. This will create uncertainties for foreign firms intending to capture business opportunities in the pharmaceutical industry.
- Even after accession, Chinese authorities have retained pricing control over imported pharmaceuticals, and many have adopted administrative measures that do not accord with the principles of the SPS Agreement and national treatment. Such measures may increase the risks for investment.
- The Chinese market remains an imperfect one. Its operation mechanisms are still very different from the western type of market mechanism. Various interest groups exist, including the lower level of local governments, professional supervisory agencies and industrial groups. For this reason, the pharmaceutical industry and market still retain barriers and distortions for foreign investors. Hope lies in strict implementation of China's WTO commitments—opening up China's market and creating an environment in which both domestic and foreign firms can compete on an equal footing.

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