APPROACHING A NEW MARKET: THE ACTIVITIES OF MULTINATIONAL PHARMACEUTICAL FIRMS IN CHINA

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ABSTRACT

Firms are increasingly finding that an international presence is required to be successful in the long run. At the same time, countries are taking a more active role in issues of economic growth and industrial policy.

This thesis explores this tension at both a conceptual and empirical level. The activities of the pharmaceutical industry in China are used as illustrations.

An analysis of the worldwide pharmaceutical industry points to the strategic value of access to the Chinese market. This is then contrasted with the opportunities now available to firms in China. These opportunities are heavily shaped by the political and economic context in which business in China is conducted.

Executives from ten U.S. pharmaceutical firms were interviewed to gather their reasons for investing in China as well as their opinions about its business environment. Their views were then compared to those derived from the analysis of both the industry and China as a place to do business.

The thesis concludes that while the firms' goals in China are consistent with those suggested by an industry analysis, they may be overlooking factors that would lead to long term success in their implementation efforts.

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I am also grateful to Denis Simon, my supervisor, for his willingness to take on a neophyte and his invaluable contributions to the development of my thinking. Arnoldo Hax, my reader, has helped me throughout the year to develop the strategic outlook I used in approaching this subject.

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CHAPTER ONE

INTRODUCTION

Firms are increasingly finding that an international presence is required to be successful in the long run. Economies of scale of all types -- development, marketing, and distribution as well as manufacturing -- have become critical success factors in many industries. Furthermore, companies active in only one market are far more vulnerable to predatory actions of competitors than those serving broader markets.

Simultaneously, countries throughout both the developing and developed world are taking a more active role in issues of economic growth and industrial policy. National governments are less willing to adopt a laissez-faire approach to economic matters. Instead, they are taking active steps to develop and sustain certain high technology industries, to protect the jobs of their citizens, and, often, to encourage exports.

A major difficulty facing firms is that the strategic imperative to globalize frequently conflicts with the goals of national governments. Resolving this tension can be a key source of competitive advantage for firms.

This thesis explores this tension at both a conceptual and empirical level. The activities of the pharmaceutical industry in China are used as illustrations.

An unusual feature of the pharmaceutical industry is that the major firms within it, of whom there are many, have been international in scope for the last several decades. It is an industry which has had many of the features of globalization for an extended period. These include limited national differences in customer demand. Likewise, research and development have been directed towards drugs with widespread applicability. In other respects, the industry has remained very nation specific. Governments play an active role in regulating and protecting firms operating within their boundaries. Product prices are also established country by country, rather than internationally.

The pharmaceutical industry is not, therefore, newly emerging as an international industry. Rather, it is moving towards new forms of competitive advantage beyond that of maximizing product distribution.

The industry's historical, and still valid, imperative of seeking out new markets internationally has led many firms in it to respond enthusiastically to China's announced intentions of increasing the role of foreign firms in its economy.

China's announcement should not be interpreted as an opportunity for unilateral action by the pharmaceutical firms, however. The shifts in Chinese policy came out of a unique political and economic environment. That environment shaped the policy changes and can be counted on to heavily influence the direction of China in the future. These statements are true for any country, of course, but take on a special significance in the case of China. China's sheer size gives it a major role in world affairs, and its government since the 1940's has been both admired and feared by foreigners.

Many firms have interpreted China's decision to involve foreigners in its economic development as a radical and permanent shift in Chinese policy. Firms acting without a deeper understanding of the political and economic environment in China are likely to make poor initial investment decisions and overlook the requirements to sustain a business in the longer term.

Firms in the pharmaceutical industry must therefore react not only to strategic imperatives but also the

particular political and economic environment they find in China if they are to sustain a long term competitive advantage there.

This thesis begins (in chapter two) by evaluating the major forces at work within the pharmaceutical industry today and relevant trends for the future. The analytical framework is that of Arnoldo Hax and Nicolas Majluf as described in their book, Strategic Management: An Integrative Perspective.[1] Michael Porter's framework[2] of five forces as a determinant of an industry's structure is used to assess competition within the industry. This analysis reveals what I call the strategic imperatives of the industry, the major issues firms should be addressing.

Having identified those factors "pushing" the industry, the thesis then switches to defining the "pull" of a particular new market, China. China's economic and political environment as it impacts business is assessed. The issues affecting foreign firms attempting to do business there are divided into eight categories, and an evaluation of the impact of each is made.

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[1] Arnoldo C. Hax and Nicolas S. Majluf, Strategic Management: An Integrative Perspective (New Jersey: Prentice Hall, Inc., 1984), pp. 328-332.

[2] Michael E. Porter, Competitive Strategy: Techniques for Analyzing Industries and Competitors (New York: The Free Press, 1980), pp. 3-33.

The fourth chapter expands on the general discussion on China as a place to do business. The pharmaceutical industry there is analyzed, again using the framework suggested by Hax and Majluf. Since very little has been written in English on the industry, considerable descriptive material is included. The most likely opportunities for successful foreign firm endeavors are identified.

The preceding analyses are based on a review of literature on both the pharmaceutical industry and the Chinese business environment. In contrast, firms' viewpoints were gathered through a series of interviews with executives responsible for Chinese business activity in ten U.S. pharmaceutical firms.

Their opinions are presented in the next chapter, chapter five. A major portion of that chapter concerns itself with firms' stated reasons for investing in China. The degree to which those reasons are consistent with the industry's strategic imperatives and Chinese objectives is assessed. The executives' perceptions of the eight issues affecting foreign firms doing business in China are also described. An effort is made to identify the impact of these issues on the process of deciding whether or not to invest in China.

The thesis concludes by contrasting firms' actual decisions relative to China with the conceptual model developed by analyzing the pharmaceutical industry in conjunction with China's political and economic environment. It is found that firms are generally very aware of overall industry trends but somewhat less familiar with the unique challenges and opportunities presented by China. As a result, some may find their activities there more limited in long term profit potential than they currently anticipate.

CHAPTER TWO

THE WORLDWIDE PHARMACEUTICAL INDUSTRY

Pharmaceuticals are a key element of medical care throughout the world. They may be compounded from herbs or produced by highly sophisticated chemical processes. They may be targeted towards a very specific medical condition or have broad based applications. They may be used worldwide or restricted to a particular region.

Although pharmaceuticals may be broken into many subgroups, for the purposes of this thesis they can be divided into three main categories, roughly correlated with their technology content.

The least complex group in terms of technology is the over-the-counter (OTC) drugs, also called proprietary drugs. They are sold directly to the consumer without requiring the authorization of a medical professional.

An interim group of products from a technology perspective is the generic drugs. These generally have greater hazards associated with them than OTC drugs and

require a prescription from a medical professional in order to be acquired. They are not under patent, so there are no legal restrictions on their manufacture. Generics are increasingly being sold not only under the generic name but also under the trademark of the manufacturer or distributor.

The final category of drugs is the more recently developed ones still under patent. These also require authorization from medical authorities in order to be purchased. They are generally called ethical drugs, although this label is often applied to generic drugs as well.

The intent of this chapter is to describe and analyze the pharmaceutical industry, focusing particularly on its international aspect. Generally, the study is limited to generic and ethical drugs, since OTC drugs are sold in very different markets than prescription drugs. It is impossible however to make too refined a distinction since firms often provide all three types. They can also substitute for each other in some limited circumstances. A final complication arises when differences in international dispensing practices are considered.

The chapter begins with a description of the worldwide market for pharmaceuticals. It then shifts to a discussion of the sources of pharmaceutical supply, and

the nature of competition in the pharmaceutical industry. That in turn is followed by a review of governments' and societies' interactions with this industry. Government and, more broadly, social concerns have had and will continue to have a significant impact on pharmaceutical firms. Technological factors have been a driving force in this industry for several decades, and they too are summarized. Economic factors at large have had a lesser impact but are becoming one of the largest issues facing the industry.

The analysis is based on the approach to environmental scanning at the business level suggested in Arnoldo Hax's and Nicolas Majluf's Strategic Management: An Integrative Perspective[1]. The analysis is geared towards a review of the industry as a whole and is not intended to reflect the very specific environment within which a particular firm operates.

The Worldwide Pharmaceutical Market

Estimates of the world pharmaceutical market in terms of human dosage form consumption range from $72 to $110 billion in 1984.[2] Statistics provided by the Intercontinental Medical Statistics (IMS) organization,

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1 Hax and Majluf, pp. 328-332.
2 SCRIP 1003 (29 May 1985): 19.

generally regarded as the most reliable, put the worldwide market at $87 billion (see Figure 2.1).[3] The market in 1968 was approximately $14 billion, suggesting an annual growth rate of 12%. Available data would suggest the rate is slowing down, from about 15% in the early part of the decade to 5% more recently. This growth is barely sufficient to keep up with inflation. The data suggests that the overall market is at a mature stage and experiencing very little nominal, if any real, growth.

This is not to argue that the world's population is healthier and no longer requires drugs, or that substitutes have become available. Significant portions of the world's population continue to lack access to pharmaceuticals, particularly in developing countries. As economic conditions improve, these markets can be expected to grow. The population in the industrialized countries

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[3] Gathering, interpreting, and analyzing data for this industry is a tricky task. Dr. M. L. Burstall and Mme. C. Michon-Savarit described some of the problems in their book on the pharmaceutical industry: "There are real difficulties in measuring production, consumption and trade in the pharmaceutical industry. Because of the multiplicity of products they must be expressed in monetary terms, by convention U.S. dollars. In times of inflation and changing exchange rates this presents obvious problems. The data available is often only approximate. Statistics of consumption refer normally to human pharmaceuticals but may include veterinary products. They may or may not include generic products." They go on to describe the difficulty of compiling production and trade statistics. M. L. Burstall and C. Michon-Savarit, The Pharmaceutical Industry: Trade Related Issues (Paris: Organisation for Economic Cooperation and Development, 1985). p. 45.

FIGURE 2.1

WORLD CONSUMPTION OF PHARMACEUTICALS

	1968[a]	1972[a]	1976[a]	1980[b]	1984[c]	68-84 ave ann growth (%)
	(current $ billion, mfcrs prices)					
TOTAL	14.5	22.5	40.2	72.3	87.1	11.9%

SOURCES: As noted below.

[a] W. Duncan Reekie and Michael H. Weber, Profits, Politics and Drugs (New York: Holmes & Meier Publishers, Inc., 1979), p. 27. Data is said to exclude Republic of China.

[b] Burstall and Michon-Savarit, p. 48.

[c] SCRIP 1041 (9 October 1985): 18 from IMS data.

is aging, thus increasing the demand for drugs. Offsetting these conditions is the decrease in the rate of introduction of new drugs and the considerable price pressure being applied. Other factors influencing the demand for drugs include population characteristics, disease incidence and trends, the social environment, the availability of new drug therapy, health care systems, environmental conditions, and medical practice.[4]

Data on country consumption (see Figure 2.2) reveals that the largest national market is the U.S., with Japan following. The European market as a whole exceeds the Japanese market, but individual markets start at less than half the size of Japan's. Within Europe, West Germany, France, Italy, and the U.K. are the largest. The next largest markets are Canada, Spain, Brazil, Argentina, India, and Mexico. The ranking twenty years ago was very similar, with the U.S. market followed by Japan, France, West Germany, Italy, and the U.K.

Although the individual markets among the developing countries are small, in total they are not insignificant. In 1984, the world market was distributed as shown in Figure 2.3. North Americans consumed 30% of the world's drugs, Western Europeans 23%, Eastern Europeans and

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[4] Barrie G. James, The future of the multinational pharmaceutical industry to 1990 (New York: John Wiley & Sons, 1977), pp. 7-14.

FIGURE 2.2

WORLD CONSUMPTION OF PHARMACEUTICALS BY COUNTRY

	1968[a]	1972[a]	1976[a]	1980[b]	1984[c]	68-84 ave ann growth (%)
	(current $ billion, mfcrs prices)					
North America	4.2	5.5	8.1	13.6	25.8	12.0%
United States	4.0	5.1	7.6	12.6	24.2	11.9
Canada	0.2	0.4	0.5	1.0	1.5	13.4
Western Europe	4.4	7.3	13.1	21.7	20.2	10.0
West Germany	0.8	1.6	3.3	5.0	5.4	12.7
France	1.0	1.5	2.8	5.0	3.9	8.4
Italy	0.9	1.4	2.0	3.2	3.1	8.0
U. Kingdom	0.4	0.6	1.0	2.2	2.5	12.1
Spain	0.4	0.7	1.3	2.0	1.3	7.6
Japan	1.4	3.2	5.4	13.2	13.0	14.9
Oceania	0.2	0.2	0.8	0.5		
Asia	0.7	1.2	2.2		10.2	12.7
India					1.1	
South Korea						1.0
Africa	0.6	0.8	0.9	12.3		
Latin America	1.3	1.8	3.3		5.2	9.0
Brazil	0.4	0.5	1.2		1.2	7.1
Argentina					1.1	
Mexico					1.0	
Eastern Europe[d]	1.8	2.6	6.5	11.0	12.7	13.0
TOTAL	14.5	22.5	40.2	72.3	87.1	11.9

SOURCES: As noted below.

a Reekie and Weber, p. 24.

b Burstall and Michon-Savarit, p. 48.

c SCRIP 1041 (9 October 1985): 18 from IMS data.

d Presumably excludes the PRC.

FIGURE 2.3

WORLD CONSUMPTION OF PHARMACEUTICALS BY REGION

	1968	1972	1976	1980	1984
		(% of world sales)			
North America	29.2	24.3	20.2	18.8	29.6
Western Europe	30.3	32.3	32.5	30.0	23.2
Japan	9.4	14.4	13.3	18.3	14.9
Oceania	1.0	0.9	1.9	0.6	
Asia (excluding Japan)	5.1	5.1	5.5		11.7
Africa	3.9	3.4	2.3	17.0	
South America	8.8	8.1	8.2		6.0
Eastern Europe	12.3	11.5	16.1	15.2	14.6

SOURCE: Figure 2.2

Japanese 15% each, South Americans 6%, and the remaining Asians and Africans 12%.

National market growth rates in the major countries have averaged around 10% (nominal) between 1968 and 1984, with Japan's higher at 15%. Growth was generally strongest from 1968-1976, with a slowdown occurring in the late 1970's and actual reductions in some markets visible in the early 1980's. The only significant exception to this trend appears to be the U.S. market, which grew strongly in the early 1980's.

The strength of the dollar in recent years has had a dampening impact on statistics on market growth, and market growth was probably higher than Figure 2.2 suggests for the 1980's for non-U.S. markets. Market growth was probably not as high as it was during the prior two decades, however. As evidence for higher growth rates than implied by Figure 2.2, I cite the 1983-1984 growth rates in local currency:

Japan	- 3%
West Germany	+ 7%
France	+10%
Italy	+10%
U.K.	+ 6%
Spain	+ 7%[5]

In balance, it would appear that not only is the world market stabilized at approximately $80 billion but the traditional major markets are growing slowly if at all.

Another important analytical viewpoint on drugs is the consumption by type of drug. Figure 2.4 breaks drugs into 6 major classes, with the proportion of sales within major markets identified. Between 1973 and 1984, alimentary tract, cardiovascular, and musculoskeletal drugs registered the largest increase in share, with anti-infective, central nervous system, and respiratory tract drugs showing least growth. In 1984, of the top 10 drugs in the world (see Figure 2.5), two were for alimentary tract disorders, four for cardiovascular problems, two for musculoskeletal complaints, and only one each in antibiotics and central nervous system.

Looking exclusively at the top sellers in the U.S. reveals a similar pattern (Figure 2.6). Of the top 10

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[5] SCRIP 1041 (9 October 1985): 18.

FIGURE 2.4

WORLD CONSUMPTION OF PHARMACEUTICALS BY PRODUCT TYPE

	1973[a] (%)	1984[b] (%)
Alimentary tract and metabolic disorders	[c]	17.3
Cardiovasculars	8.8	16.4
Anti-infectives	13.0	14.3
Central nervous system	12.5	11.9
Respiratory tract	5.9	7.8
Musculoskeletal	3.6	6.6
Other	56.2	25.7

SOURCES: As noted below.
[a] James, p. 15.
[b] SCRIP 1041 (9 October 1985): 18 from IMS data.
[c] Not separately identified.

FIGURE 2.5

WORLD CONSUMPTION OF PHARMACEUTICALS -- TOP TEN PRODUCTS

Name of product	Type of product	1984 sales ($ million)
Tagamet	Alimentary	$814
Inderal	Cardiovascular	486
Zantac	Alimentary	462
Adalat	Cardiovascular	425
Aldomet	Cardiovascular	401
Keflex/Ceporex	Anti-infective	389
Tenormin	Cardiovascular	364
Feldene	Musculoskeletal	364
Valium	Central nervous system	400
Naprosyn/Anaprox	Musculoskeletal	340
TOTAL TOP TEN DRUGS		$4445

SOURCE: SCRIP 1008 (17 June 1985): 27 per Dr. W. Duncan of ICI Pharmaceuticals.

FIGURE 2.6

U.S. CONSUMPTION OF PHARMACEUTICALS BY PRODUCT TYPE

	1965[a]	1970[a]	1975[a]	1980[a]	1984[b]
	(# of top 10 drugs in U.S.)				
Alimentary tract and metabolic disorders	2	1	0	1	2
Cardiovasculars	0	0	2	5	3
Anti-infectives	3	3	2	1	2
Central nervous system	5	4	3	1	1
Respiratory tract	0	0	0	0	0
Musculoskeletal	0	1	2	1	2
Other	0	1	1	1	0

SOURCES: As noted below.
[a] Pharmaceutical Panel, Committee on Technology and International Economic and Trade Issues, Office of the Foreign Secretary, National Academy of Engineering, Commission on Engineering and Technical Systems, National Research Council, The competitive status of the U.S. pharmaceutical industry: the influences of technology in determining international industrial competitive advantage, by Charles C. Edwards, Chairman and Lacy Glenn Thomas, Rapporteur (Washington, D.C.: National Academy Press, 1983), p. 26.
[b] SCRIP 980 (11 March 1985): 16.

brand named drugs sold in the U.S. in 1965, five treated central nervous system disorders and three were antibiotics. By 1984, cardiovascular and musculoskeletal drugs had shown the greatest growth, with antibiotics and central nervous system drugs diminishing in importance.

Pharmaceutical preparations come in thousands of human dosage forms to treat hundreds of different maladies. In spite of this broad distribution of cures, the ten top selling drugs in the world constitute approximately 6% of non-Communist country pharmaceutical consumption (see Figure 2.5).

Generic drugs, as opposed to patented, single source ethical drugs, are becoming increasingly important on a worldwide basis (see Figure 2.7). About half of U.S. prescription drug sales are now for generic drugs. Other major markets have experienced less penetration, with Japan having only 17% in 1984, and the European markets generally less. In all cases, however, the trend is towards more generic drug consumption and less patented.

The supply of pharmaceutical preparations is as international as drug consumption. Figure 2.8 shows the distribution of production throughout the world. In 1980, the single largest producer was the U.S., followed closely by Japan and then by West Germany, France, the U.K., and Italy. Other countries known to be producing more than $1

FIGURE 2.7

GENERIC DRUG PENETRATION INTO THE RETAIL PRESCRIPTION MARKET

	1979[a]	1981[b]	1982[b]	1983[b]	1984[b]
	(% share retail prescription mkt)				
United States	45.0				
West Germany		1.5	2.5	3.0	4.5
France		1.0	1.0	2.0	2.0
Italy		9.0	9.0	9.5	10.0
United Kingdom		3.0	4.0	6.0	7.0
Spain		32.0	33.0	34.0	34.0
Japan		14.0	15.0	15.0	17.0
Brazil		28.0	29.0	33.0	34.0

SOURCES: As noted below.
a Burstall and Michon-Savarit, p. 10.
b SCRIP 1031 (4 September 1985): 5.

FIGURE 2.8

WORLD PRODUCTION OF PHARMACEUTICALS BY COUNTRY

	Production				Consumption
	1968[a]	1972[a]	1976[a]	1980[b]	1980[c]
	(% of total)				(% of total)
United States	38.0	33.0	30.0	19.0	17.4
Europe					
West Germany	8.5	10.0	10.0	9.9	6.9
France	6.0	6.0	6.5	7.0	6.9
Italy	5.0	4.5	5.0	4.6	4.4
United Kingdom	6.0	5.5	5.0	4.9	3.0
Switzerland	2.0	2.0	2.5	2.8	0.8
Japan	13.0	14.5	16.0	18.2	18.3
Others	21.5	24.5	25.0	33.6	42.3

SOURCES: As noted below.

[a] Pharmaceutical Panel, p. 37. Unclear whether Eastern Europe included or not.

[b] Burstall and Michon-Savarit, p. 49.

[c] See Figure 2.2.

billion worth included Switzerland, Spain, and Canada. A comparison of production and consumption shares would indicate that for the most part countries produce as much as they consume. This tends to conceal some important underlying trends, however.

The first is to note the dramatic decrease in the U.S. share of world production between 1968 and 1980, dropping from 38 to 19%. The increases in share occurred in Japan, whose share rose from 13 to 18%. The major countries of Europe increased their share only slightly.

Although consumption shares are close to production shares, the statistics hide the levels of trade between countries. About 15% of pharmaceutical output is traded, a surprisingly small number given the low volume, high value nature of the product (see Figure 2.9). Trade is severely restricted by government regulations, as will be described later. Approximately 60% of the trade is in finished drugs, with the remainder in intermediate products. The trade in finished pharmaceuticals is primarily within Europe and from Western Europe to the developing countries. The U.S. is the single largest exporter of intermediate products. Figures 2.9 and 2.10 highlight the trade flows between major markets. Pharmaceuticals contribute to a healthy balance of payments trade surplus in the United States and Europe,

FIGURE 2.9

WORLDWIDE IMPORTS AND EXPORTS OF PHARMACEUTICAL PRODUCTS, 1982

	Production	Balance in finished drugs	Balance in inter-mediates	Overall trade balance
		($ million)		
North America	22,000	426	756	1,182
United States	20,500	502	926	1,428
Canada	1,500	-76	-170	-246
Europe	30,300	3,115	726	3,841
West Germany	6,900	659	273	932
France	6,500	833	25	858
Italy	4,400	74	-37	37
United Kingdom	4,500	778	274	1,052
Spain	1,900	48	-129	-81
Switzerland	2,500	755	407	1,162
Japan	15,950	-575	-369	-944
Australia	600	-23	-69	-92
Other developed	500	-155	-38	-193
TOT. DEVELOPED	69,350	2,788	1,006	3,794
Asia	4,800			-450
Africa	750			-1,530
Middle East OPEC	300			-1,120
Latin America	5,200			-755
Command Economies	14,000			-50
TOTAL	95,000	8,000[a]	6,000[a]	14,000[a]

SOURCE: Compiled from SCRIP 996 (6 May 1985): 16.
[a] Absolute levels.

FIGURE 2.10

IMPORTS AND EXPORTS OF PHARMACEUTICAL PRODUCTS

	1960[a]	1965[b]	1970[a]	1975[b]	1980[a]	1985[c]
	(current $ million)					
United States						
Imports	26		87		803	1887
Exports	275		422		2036	2894
Balance	+249	+198	+335	+639	+1233	+1007
Europe						
Imports	257		1227		6710	
Exports	594		1929		10400	
Balance	+337		+702		+3690	
W. Germany		+164	+316	+528	+981	
France		+55	+86	+293	+796	
Italy		+2	+11	+40	+34	
U. Kingdom		+156	+254	+611	+1208	
Switzerland		+147	+251	+669	+1204	
Japan						
Imports	17		216		1074	
Exports	17		66		294	
Balance	0	-27	-150	-316	-780	
Rest of the world						
Imports	511		1168		4986	
Exports	5		218		707	
Balance	-506		-950		-4279	
TOTAL						
Imports	811		2698		13573	
Exports	891		2635		13437	

SOURCES: As noted below.
[a] Burstall and Michon-Savarit, p. 16, 50, 51, except European country detail for 1970 and 1980, which is from Pharmaceutical Panel, p. 49.
[b] Pharmaceutical Panel, p. 49.
[c] Medical Marketing and Media 20 (September 1985): 76. Also, SCRIP 1023 (7 August 1985): 16.

while imports significantly exceed exports for Japan and the rest of the world.

A closer examination of shares of world exports again reveals the U.S. firms' decline since 1955 (Figure 2.11). Although West Germany's share has grown, the shares of the rest of the major producers have remained roughly constant. Japan has sustained a minuscule share throughout the postwar period.

Exports are a significant proportion of domestic production, particularly for the European countries (Figure 2.12).

A third important underlying feature is that foreign firms play a major role in most countries' drug consumption. Figure 2.13 shows the high degree of market share held by foreign firms in most markets. The two largest markets -- the U.S. and Japan -- are dominated by domestic firms. The European markets with large pharmaceutical industries of their own nonetheless have a large portion of sales accounted for by foreign firms (35-60%). The developing countries have an even larger share (75%) taken by foreign firms. Although these statistics reflect domestic and foreign share of consumption, they are not exclusively a result of high levels of imports. They also reflect ownership of means of production by foreign firms within the country.

FIGURE 2.11

EXPORTS OF PHARMACEUTICALS, SELECTED NATIONS' MARKET SHARE

	1955[a]	1960[a]	1965[a]	1970[a]	1975[a]	1980[b]
			(% of total)			
United States	34	30	16	15	13	15
Europe						
W. Germany	10	12	16	19	16	17
France	12	11	11	9	10	11
Italy	3	4	5	6	6	5
U. Kingdom	16	14	13	13	13	13
Switzerland	14	13	14	13	13	12
Netherlands	3	5	5	6	5	4
Japan	1	2	3	2	2	2
Rest of world	7	9	17	17	22	21

SOURCES: As noted below.
[a] Pharmaceutical Panel, p. 50.
[b] Burstall and Michon-Savarit, p. 51. Excludes CMEA and PRC.

FIGURE 2.12

EXPORTS OF PHARMACEUTICALS AS A PROPORTION OF DOMESTIC PRODUCTION

	1965[a]	1970[a]	1975[a]	1980[b]
	(% of domestic pharm. production)			
United States	6	6	11	13
Europe				
West Germany	25	28	24	27
France	11	18	21	25
Italy	11	17	17	17
United Kingdom	27	45	55	42
Switzerland	90	91	na	67
Japan	na	2	2	2

SOURCES: As noted below.
a Pharmaceutical Panel, p. 49.
b Burstall and Michon-Savarit, p. 49.

FIGURE 2.13

PHARMACEUTICAL MARKET SHARES HELD BY DOMESTIC AND FOREIGN FIRMS

	Made by locally owned companies	Made locally by foreign owned companies	Direct imports
	(source in %, 1980)		
United States	81	17	2
Europe			
West Germany	65	20	15
France	47	50	3
Italy	44	48	8
United Kingdom	46	38	16
Switzerland	39	na	61
Japan	86	10	4
Developing countries	26	49	25
TOTAL (excl. CMEA, PRC)	60	27	13

SOURCE: Burstall and Michon-Savarit, p. 14.

The supply of drugs is international in flavor, with several countries serving as major producers and important trade flows between them and the rest of the world. To a large degree then, this has the appearance of a truly global industry, although information on the competitive structure of the industry is necessary to confirm that.

The customer for drugs is generally not, in fact, the consumer, with the exception of over-the-counter drugs. In most of the major markets, the customer is the prescribing physician, who makes the selection of drugs for the end consumer. Doctors generally are insensitive to price and prescribe on the basis of their understanding of the medical benefits and costs associated with particular drugs. In some countries, concern over rising health costs has inserted national medical authorities into the market as customers. In many cases, they actively determine which drugs will be reimbursed through the national health system, thus, in effect, shaping the demand as much as individual prescribing physicians. This has become increasingly true in the case of developing countries, who are being encouraged to support only drugs on the World Health Organization's essential drugs list.

Information on the profitability of this industry on a worldwide basis is limited. Restricting such an evaluation to the U.S. drug industry reveals that it earns

higher returns than a composite of all industries on most measures (see Figure 2.14). Returns on equity and net profit margin are higher than industry averages. Sales growth has been slightly below industry averages as has been growth in earnings per share. Overall, trends since the early 1970's have been deteriorating.

Competitive Forces

The competitive forces affecting an industry as complex and international as pharmaceuticals are not unexpectedly diverse and frequently conflicting. Michael Porter's framework for analyzing competitive forces will be used to study the pharmaceutical industry.[6]

A description of the forces as they relate to the industry will serve to preface an assessment of the industry's current position and where it appears to be headed.

Who are the competitors in this industry? Figure 2.15 identifies the top 15 drug companies in the world as of 1984, with their ranking in 1973 shown as a reference. Seven firms remained in the top ten in both years -- Merck, American Home Products, Hoechst, Bayer, Ciba-Geigy, Pfizer, and Bristol-Myers -- although their relative

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[6] Porter, pp. 3-33.

FIGURE 2.14

U.S. PHARMACEUTICAL INDUSTRY PROFITABILITY INDICATORS

	1971-75 five yr ave[a]	1976-80 five yr ave[b]	1981-85 five yr ave[c]
GROWTH			
Sales growth (%)			
All industry median	10.9	14.3	6.9
Drug industry median		12.8	6.9
Ethical drug ind. median	13.7	13.5	
Proprietary drug. median	10.7	10.9	
Earnings per share growth (%)			
All industry median	7.1	13.9	9.3
Drug industry median		11.4	8.2
Ethical drug ind. median	10.0	12.5	
Proprietary drug median	8.2	7.8	
PROFITABILITY			
Net profit margin (%)[d]			
All industry median	3.9	5.0	3.8
Drug industry median		9.2	9.6
Ethical drug ind. median	10.7	12.8	
Proprietary drug median	7.0	7.1	
Return on equity (%)			
All industry median	11.6	15.8	13.7
Drug industry median		19.4	18.9
Ethical drug ind. median	22.6	21.4	
Proprietary drug median	16.8	15.4	

SOURCES:
a Forbes 117 (1 January 1976).
b Forbes 127 (5 January 1981).
c Forbes 137 (13 January 1986).
d Most recent 12 months.

FIGURE 2.15

FIFTEEN LARGEST PHARMACEUTICAL COMPANIES IN THE WORLD, 1984

	Country	84 Pharm Sales[a] ($mill)	(% of total sales)	1984 Rank	1973 Rank[b]
Merck & Co.	U.S.	2,657.8	4.3	1	2
American Home Prod.	U.S.	2,416.8	3.9	2	6
Hoechst	W. Ger.	2,378.3	3.8	3	4
Bayer	W. Ger.	2,192.8	3.5	4	8
Ciba-Geigy	Switz.	2,156.9	3.5	5	5
Pfizer	U.S.	1,891.0	3.0	6	7
Abbott Lab.	U.S.	1,706.0	2.7	7	21
Eli Lilly	U.S.	1,664.0	2.7	8	11
Bristol-Myers	U.S.	1,586.6	2.5	9	9
SmithKline Beckman Beckman	U.S.	1,542.2	2.5	10	31
Hoffmann LaRoche	Switz	1,477.6	2.4	11	1
Sandoz	Switz.	1,472.3	2.4	12	10
Upjohn	U.S.	1,449.0	2.3	13	17
Warner-Lambert	U.S.	1,409.0	2.3	14	3
Takeda	Japan	1,297.8	2.1	15	14
TOTAL		27,298.1	43.9%		

SOURCES: As noted below.

[a] SCRIP 1049 (6 November 1985): 14. Total sales computed at $62.3 billion based on data provided. Presumably excludes Eastern Bloc countries.

[b] James, pp. 248-249.

positions shifted. Abbott, Lilly, and SmithKline Beckman improved their positions between 1973 and 1984; Hoffmann LaRoche, Warner-Lambert, and Sandoz slipped.

Figure 2.16 summarizes the company information by country of ownership. Of the top 25 in 1982, thirteen are U.S., four are U.K., three each are based in Germany and Switzerland, and one each in France and Japan. In spite of the size of the domestic Japanese market, the Japanese pharmaceutical industry has yet to play a significant role in the global industry. Its high level of R&D activity, as well as the Japanese government's efforts to concentrate the industry, could well change this situation, however.

As can be seen from Figure 2.15, no firm in 1984 had more than 4.3% of the non-Communist countries pharmaceutical market, so that overall industry concentration is very low. As a group, however, the top 15 firms contributed 44% of 1984's worldwide sales (excluding the Communist countries). These apparent low levels of concentration conceal, however, very high levels of concentration by specific therapeutic category. In 1973, for example, the five leading firms within each major therapeutic category accounted for overwhelming proportions of total consumption of that category. The five leading firms accounted for no less than 70% of U.S.

FIGURE 2.16

PHARMACEUTICAL SALES OF THE TOP 25 PHARMACEUTICAL COMPANIES BY NATIONALITY

	1973[a]		1977[b]		1982[c]	
	(# of cos.)	(% of sales)	(# of cos.)	(% of sales)	(# of cos.)	(% of sales)
United States	13	53	12	48	13	52
Europe						
West Germany	4	15	4	20	3	17
France	2	6	1	3	1	3
Italy	1	2				
United Kingdom	1	2	2	5	4	10
Switzerland	3	18	3	16	3	14
Japan	1	4	1	3	1	4
Other			2	5		
TOTAL	25	100	25	100	25	100

SOURCES: As noted below.

[a] James, pp. 248-249.

[b] United Nations, Centre on Transnational Corporations, Transnational Corporations and the Pharmaceutical Industry (E.79.II.A.3, 1979), pp. 110-111.

[c] Burstall and Michon-Savarit, p. 55.

sales in each of the therapeutic categories, with generally only one or two firms constituting 50% of the category's sales.[7] This paints a much different picture than the overall market share figures would indicate. Companies clearly compete within given narrowly defined therapeutic categories and hold significant shares there.

The reverse is true as well -- individual companies are highly dependent on a few products. Figure 2.17 shows the proportion of total domestic U.S. pharmaceutical sales provided by the three best selling products for some major firms operating within the U.S. In 1979, about half the firms' sales were dependent on three products, although individual firms ranged between 25 and 70 percent. There appears to be no correlation between firm size and its dependence on just a few products for its pharmaceutical sales. There also seems to be little evidence of a distinctive trend in such dependence over the nine years shown in the chart. Some firms have increased their dependence; some have reduced it.

The competitors are not just dependent on their home country market, they are also highly dependent on foreign sales. Table 2.18 reflects the extent of this dependence for U.S. firms. Since 1967, firms have generally increased their dependence on foreign sales and in 1984 it

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[7] United Nations, Centre on Transnational Corporations, pp. 125-129.

FIGURE 2.17

PROPORTION OF TOTAL DOMESTIC U.S. PHARMACEUTICAL SALES PROVIDED BY THREE BEST SELLING PRODUCTS, SELECTED PHARMACEUTICAL CORPORATIONS

	1970	1975 (%ages)	1979
United States			
Abbott	36	33	28
American Home Products			
Ayerst	64	74	84
Wyeth	37	44	43
Bristol-Myers			
Bristol	69	46	28
Mead-Johnson	40	38	37
Lederle	48	31	32
Eli Lilly	46	60	43
Merck	35	44	44
Pfizer	52	65	65
A. H. Robins	43	45	46
Schering-Plough	42	48	40
Searle	45	49	44
SmithKline Beckman	44	42	66
Squibb	28	31	23
Upjohn	47	50	56
Warner-Lambert			
Warner	53	na	na
Parke-Davis	25	27	22
United Kingdom			
Burroughs Wellcome	na	56	51
Switzerland			
Ciba-Geigy	47	na	55
Hoffmann LaRoche	80	80	70

SOURCE: Pharmaceutical Panel, p. 15, originally from IMS data.

FIGURE 2.18

FOREIGN SALES OF MAJOR U.S. PHARMACEUTICAL FIRMS

	1967[a]	1971[a]	1977[a]	1984[b]
	(% of total sales)			
Abbott	28	32	32	28
American Home Products	22	25	31	23
Baxter-Travenol				30
Bristol-Myers	17	18	31	30
Cyanamid	19	21	34	
Johnson & Johnson	28	31	41	39
Eli Lilly		31	37	32
Merck	33	40	45	43
Pfizer	48	49	51	44
Robins				23
Rorer				31
Schering-Plough	39	34	43	43
Searle	22	36	37	28
SmithKline Beckman	20	26	36	35
Squibb	22	27	33	40
Sterling				38
Upjohn	26	34	37	30
Warner-Lambert	33	37	43	40
AVERAGE	26	25	29	34

SOURCES: As noted below.

[a] United Nations, Centre on Transnational Corporations, p. 142.

[b] Company annual reports.

averaged about 34% for U.S. firms, with a range from 23% (American Home Products and Robins) to 44% (Pfizer). European firms obviously have a high proportion of sales abroad given the large volume of exports from those countries.

The large multinational drug firms are vertically integrated. They undertake extensive R&D, with laboratory facilities not only in their home country but also abroad. They manufacture both the active ingredients of their products as well as the human dosage forms. In general, the active ingredient manufacturing is conducted in the industrialized countries, both because the processes are more sophisticated and also to maintain their secrecy. Drug formulation and packaging is done in both developed and developing countries. The firms also have very strong distribution networks of "detail men" who sell drugs one on one to physicians. These networks are strongest in a firm's home country, but have been built up over the years in foreign countries as well.

A further feature of the industry is the extent of diversification of the firms. Figure 2.19 shows the proportion of pharmaceutical sales as a percentage of total sales. There was, in 1984, a wide range in the degree to which pharmaceuticals contributed to firms' sales. The German firms were generally the least

FIGURE 2.19

PHARMACEUTICAL SALES AS A PROPORTION OF TOTAL SALES, SELECTED CORPORATIONS

	1967[a]	1973[a]	1977[b]	1984[c]
	(% of total sales)			
United States				
Abbott			47	55
American Home Products			39	54
Bristol-Myers			30	38
Johnson & Johnson			18	21
Eli Lilly	63	60	53	54
Merck		86	84	75
Pfizer		50	50	62
A. H. Robins			69	57
Rorer				60
Schering-Plough			63	56
Searle	80	42	51	47
SmithKline Beckman			53	52
Squibb			50	58
Sterling	33	31	14	14
Upjohn			66	66
Warner-Lambert			40	44
West Germany				
Bayer			13	14
Boehringer Ingelheim			77	
Hoechst			16	16
France				
Rhone Poulenc			13	
United Kingdom				
Beecham	29	36	36	
Glaxo			72	
ICI			5	
Wellcome			65	
Switzerland				
Ciba-Geigy		29	28	29
Hoffmann LaRoche		70	51	42
Sandoz	51	53	48	46
Japan				
Takeda		59	65	57

SOURCES: As noted below.
[a] Bruna Teso, Technical Change and Economic Policy: Science and Technology in the New Economic and Social Context: Sector Report: The Pharmaceutical Industry (Paris: Organisation for Economic Co-operation and Development, 1980), p. 20.
[b] United Nations, Centre on Transnational Corporations, p. 110.
[c] Company annual reports.

dependent on pharmaceuticals (Bayer 14%; Hoechst 16%), as was the French firm Rhone-Poulenc at 16% (in 1982). The Swiss firms earn just under half of their revenues from pharmaceuticals, and the U.S. and Japanese generally earn over 50%, with Merck the highest at 75% and Johnson and Johnson the lowest at 21%.

Most pharmaceutical firms began as drug suppliers. Others began as dyestuff or chemical firms and used their technology base to diversify into drugs in the early part of this century. Very few firms have successfully diversified into pharmaceuticals from technologically unrelated businesses. In the late 1960's and early 1970's there was a wave of consolidations of pharmaceutical firms throughout the world. U.S. and, later, European firms expanded geographically during this period as well, setting up manufacturing and distribution mechanisms on a worldwide basis. During the 1970's, pharmaceutical firms diversified into such technologically related industries as cosmetics and animal health products, or into industries with the same customers but different technology bases, such as health care products and services. Some also diversified into totally unrelated activities. In recent years, many of the large firms have begun shedding these peripheral businesses to focus exclusively on the broadly defined health care market.

In summary, the competitors within this industry are all diversified multinationals, dependent on pharmaceuticals for only a portion of their revenues and, with few exceptions, quite dependent on sales outside their home country. None of them dominate the industry, although they individually dominate certain therapeutic categories.

Having identified the competitors, it is now relevant to analyze the five forces spelled out by Porter. These include:

rivalry among competitors;

barriers to entry and exit;

power of buyers;

power of suppliers; and

availability of substitutes.

Rivalry among Competitors

Rivalry among competitors is currently somewhat intense and will become increasingly so. There are, as has been shown, a very large number of equally balanced competitors. Although they have traditionally tended to focus on specific therapeutic specialties, they are currently attempting to broaden out their product portfolio into the faster growing areas, such as

cardiovascular, anti-cancer, and anti-ulcer drugs. As they each endeavor to introduce new products, or imitative versions of competitors', the pressure of equally balanced firms will become increasingly intense.

Accompanying these large numbers of firms is the diversity between them. This is currently most noticeable internationally, where the U.S. firms are in many ways similar among themselves and the European firms likewise (for example, in their ratios of pharmaceutical sales to total corporate revenue). Since these firms operate in the same markets, this tends to increase the extent of rivalry largely because of the inevitable variations in long run objectives.

This diversity will increase. Signs of it are already visible in the U.S., where drug companies have been subject to several takeover attempts in 1985. One drug company (Baxter-Travenol) bought a health care products firm (American Hospital Supply). More recently, Schering-Plough announced its intention to acquire Key Pharmaceuticals. A chemical company (Monsanto) bought a drug company (Searle). And a third drug company (Richardson-Vicks, selling over-the-counter drugs only) was bought by a broad based consumer products company (Procter & Gamble). Most industry analysts believe this trend is likely to continue. It is possible that this

increased diversity will lower the strategic and emotional importance of pharmaceuticals to these companies, thereby decreasing rivalry. With a few exceptions, however, the firms in this industry depend heavily on pharmaceuticals for revenue and profit, and are likely to continue to do so.

Another factor affecting the degree of rivalry is the fixed cost associated with the industry. Although this is not a highly capital intensive industry, with the exception of some active ingredient manufacturing, it is generally very knowledge intensive. Products are currently estimated to cost $100 million to bring to market (including the cost of covering failed products). With that much invested, firms work vigorously to protect their markets.

The industry has gone through a major cycle on the degree of specialization of its products. Prior to World War II, drugs were unpatented combinations of ingredients generally formulated by the pharmacist. The R&D intensive era in the industry began with the sulpha drug discoveries in the 1930's and the rise of antibiotics in the 1940's and 1950's. During most of the postwar period, drugs have been highly differentiated, protected both by patent as well as trademarks (on drugs with expired patents). In many countries, where generic competition is minimal, this

is still the case. In most markets, however, as shown in Figure 2.7, generic products are beginning to command a substantial share of the market. This trend will almost certainly continue with the increasing pressures to reduce health care costs. In contrast to patented drugs, generic drugs are essentially commodities, although a few firms are attempting to create a market for branded generics.

In the United States market, the traditional pharmaceutical firms have been slow to expand into generic drug production, and many small, non-R&D oriented firms supply the market. The traditional basis for pharmaceutical competition has been via specialized, knowledge intensive products. Once the knowledge becomes public property, the large pharmaceutical firms have essentially relinquished the market to suppliers who compete exclusively on cost. The growth of generics is therefore not just taking margin away from the traditional firms but market share as well. Needless to say the ethical drugs manufacturers' association continues to fight the spread of generic drugs, with little visible success.

A final impetus to rivalry is the apparent slowdown in worldwide demand for drugs, as described earlier. With the market growing slowly, it is inevitable that rivalry will intensify.

Overall then, the industry would appear to be of medium attractiveness currently, and slipping to a diminished attractiveness in the years ahead (see Figure 2.20).

Barriers to Entry

Entry into the industry is only moderately difficult and becoming somewhat easier, making the industry susceptible to new entrants. Traditionally, firms in the industry have not enjoyed absolute cost advantages leading to barriers to entry. Access to inputs has been ample. Most raw materials are fine chemicals procurable from multiple sources. For firms lacking the ability or desire to manufacture pharmaceutically active ingredients, there are significant amounts of bulk drugs available for purchase. This has been particularly important for firms in developing countries. Learning curve effects appear to be minimal. Proprietary low cost product designs have not been nearly as significant as proprietary products serving unique consumer needs. Increasingly, however, absolute cost advantages are likely to become important for competitive success, and thus will serve as a barrier to entry for new firms.

FIGURE 2.20

COMPETITIVE FORCES: RIVALRY AMONG COMPETITORS

		--	-	-0-	+	++	
# of equally balanced competitors	Large	TF					Small
Diversity of competitors	High	F	T				Low
Strategic stakes	High		T	F			Low
Fixed or storage cost	High			TF			Low
Capacity increases	Large increments				TF		Contin.
Product features	Commod.		F		T		Spec.
Industry growth	Slow		F	T			Fast
OVERALL			F	T			

NOTE: T represents 1986 environment; F reflects anticipated future trends. -- indicates highly unattractive; - mildly unattractive, -0- neutral, + mildly attractive and ++ highly attractive.

Capital requirements in terms of plant and equipment are fairly low. There are some economies of scale in pharmaceutical manufacturing, particularly of the active ingredients. Such scale as is required can be more than satisfied in plants producing only a small portion of world requirements. The investment in R&D, however, can be substantial for firms choosing to compete in the specialty products arena. Most of the investment is required during the drug development phase. Firms with innovative product concepts are forging alliances with major drug firms to perform drug development. By doing so, they bypass this barrier to entry. A recent example is Collaborative Research Inc.'s work with the Swiss firm Sandoz Ltd. to develop a new clot dissolver for heart attack victims[8].

Firms without the resources to develop innovative new drugs are likely to find barriers high because of the generally high level of product differentiation that exists. As mentioned earlier, the traditional strong product differentiation via patents and trademarks is being severely eroded by the growth in generic drugs. The costs for buyers to switch from one product to another vary, depending entirely on the range of therapeutic substitutes available. If there are none, then switching

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[8] Wall Street Journal, 10 March 1986, p. 19.

costs as perceived by the buyer are very high. Otherwise they would be low. I perceive that switching costs will be lowered further by the penetration of generic drugs.

Access to distribution channels can be a very severe barrier for firms new to a particular market. Traditionally this has been handled within the industry through licensing agreements between firms. For example, Motrin, the eleventh largest selling drug worldwide in 1984, is owned by Boots (in the U.K.) but marketed through Upjohn in the U.S. The same type of licensing and marketing agreements exist outside the U.S. Most U.S. firms in Japan have marketed their products there through Japanese drug companies. Although the costs of setting up distribution are high, primarily because of the intensive one on one sales relationship required with physicians, the industry has developed convenient ways to work around them.

With firms traditionally focusing on different market segments in terms of therapeutic needs, retaliation directed towards new entrants into the industry was minimal. As firms begin to compete with each other in the high growth therapeutic classes, I expect that to change.

Probably the toughest barrier facing firms attempting to enter the industry is the role of the government in authorizing drugs for consumption. This will be covered

more in the section under the governmental role, but continues to be a major deterrent to entry into the industry. At the same time, governments are highly motivated to encourage lower cost suppliers, thus creating a positive environment for new entrants intending to compete on a cost basis.

Overall then, barriers to entry are moderate and I believe they are diminishing somewhat. A firm with an innovative new product in terms of therapeutic value or drug delivery (ex. Key Pharmaceutical with its controlled release products) can break into this industry (see Figure 2.21).

Barriers to Exit

The primary barriers to exit from this industry, as I see them, are the emotional ones surrounding the traditional importance of pharmaceuticals within most of these firms. Few firms leave the industry entirely, although there have been examples. Richardson-Vicks, for example, divested its pharmaceutical activities to Dow Chemical in the 1970's. More frequently, firms are required to abandon certain drugs which have been found to cause unanticipated health problems, such as Eli Lilly in 1982 with its arthritic drug Oraflex, or to create

FIGURE 2.21

COMPETITIVE FORCES: BARRIERS TO ENTRY

		--	-	-0-	+	++	
Absolute cost advantage	Unimp.		T		F		V. imp.
Proprietary learning curve	Unimp.			TF			V. imp.
Access to necessary inputs	Ample	TF					Restr.
Proprietary low cost product design	Unimp.	TF					V. imp.
Capital requirements	Low		TF				High
Economies of scale	Small		TF				Large
Access to latest technology	Ample				F	T	Restr.
Product differentiation	Little			F	T		Big
Brand identity	Low			F	T		High
Switching cost	Low		F	T			High
Access to distribution channel	Ample			F	T		Restr.
Expected retaliation	Low	T		F			High
Government protection	Non-existent				F	T	High
OVERALL				FT			

excessive legal liabilities, such as Dow's withdrawal of Bendectin, an anti-nausea drug for pregnant women. Abandoning a drug results in recall costs, which are relatively low, as well as a write-off of unamortized development expense, a loss of future revenue, and a severe blow to the image of the firm and the morale of its scientific resources. In an ongoing firm, such resources are redeployable. In a firm quitting the industry altogether, there would be more problems. There are few government or social restrictions to a firm abandoning a drug or even, I suspect, the industry.

Overall, then, barriers to exit would appear to be moderate and not lead to any particular intensification of competitive rivalry (see Figure 2.22).

Power of Buyers

Buyers have had very little influence on the intensity of competitive rivalry within this industry, but their power will be much stronger in the future. The power of buyers on an industry can be divided into two sources. One is their bargaining position; the other is their sensitivity to price.

Bargaining leverage is determined, among other things, by the number of important buyers. The traditional

FIGURE 2.22

COMPETITIVE FORCES: BARRIERS TO EXIT

		--	-	-0-	+	++	
Emotional barriers	High		TF				Low
Strategic inter-relationship	High		TF				Low
Asset specialization	High					TF	Low
People specialization	High	TF					Low
One time cost of exit	High			TF			Low
Government and social restrictions	High			TF			Low
OVERALL				TF			

customer for pharmaceuticals is the individual physician, of whom there are thousands if not millions worldwide. In the future, as governments and health insurers take a more active role in drug procurement, the number of buyers will probably diminish. Countries that adopt some mechanism such as procurement off an essential drug list could convert a market with many buyers into a monopsony.

Although there are few medical substitutes for drugs, there are usually choices between drugs for individual medical conditions. For the industry as a whole, buyers have few options other than no treatment, although the opposite is true for individual companies' products. Likewise, the cost for a buyer to switch from one drug to a substitute drug is low when a substitute is available.

The individual consumer today buys very small quantities of drugs. As governments become more actively involved, their volume of purchases will become relatively much larger, giving them considerable bargaining influence. This is obvious today in countries with national price lists, such as Japan and the U.K.

The information available to doctors on drugs has traditionally been supplied by the drug firms themselves, obviously to their advantage. The advocacy of generic drug firms and such organizations as WHO is increasing the sources of information available to physicians.

Buyers are generally unlikely to backward integrate into pharmaceutical development and production themselves, although this is a threat governments can and have made. The threat of the industry forward integrating into drug consumption seems highly implausible!

Overall, buyers have traditionally had very little bargaining power vis a vis the pharmaceutical firms. This is changing, however, as governments get more actively involved in health care.

The emerging role of governments in health care has also increased the sensitivity of buyers to price. The high degrees of product differentiation and brand identity have helped firms preserve fat margins. Customers are not indifferent to the role drugs play because they are often crucial to health care improvement. Doctors are motivated to stay informed of available drug treatments for their patients. Drugs are generally much lower cost than other forms of medical treatment (i.e. surgery, hospitalization, etc.). The customers (i.e. doctors) do not pay for them, so until recently there was little focused attention on drug prices except in developing countries. That is changing, as has been identified.

Overall, the power of buyers is low, thus providing a favorable environment for firms in the industry. The

shift towards more institutional involvement in drug procurement will, however, alter this (see Figure 2.23).

Power of Suppliers

Suppliers have little effect on the intensity of rivalry within the industry. The large multinational drug firms are vertically integrated, undertaking extensive R&D, manufacturing the chemicals constituting their drugs' active ingredients, and formulating and packaging these chemicals into human dosage forms. European drug firms are also frequently significant players in the chemical industry so no doubt generate many of their raw materials internally. Many firms in developing countries, whether locally or foreign owned, simply formulate drugs from imported active ingredients. There are also firms specializing in the manufacture of bulk drugs. In recent years Eastern Europe and China have grown in importance as low cost manufacturers of some bulk drugs such as vitamins (OTC) and antibiotics.

For the most part though, pharmaceutical manufacturers' inputs come from chemical manufacturing firms. Most such chemicals are commodities with multiple sources available, particularly on the international market. Switching from one source of supply to another

FIGURE 2.23

COMPETITIVE FORCES: POWER OF BUYERS

		--	-	-0-	+	++	
# of important buyers	Few			F		T	Many
Availability of substitutes of the industry products	Many					TF	Few
Buyer switching costs relative to firm switching costs	Low		F	T			High
Buyer volume	High		F			T	Low
Buyer information	High		F		T		Low
Buyer's threat of backward integration	High					TF	Low
Industry threat of forward integration	Low	TF					High
Product differentiation	Little			F	T		Big
Brand identity	Low			F	T		High
Contribution to quality or service of buyer's product	Large		TF				Small
Total buyer's cost contributed by the industry	Large fraction			F		T	Small fract.
Decision makers' incentives	High		F			T	Low
OVERALL				F	T		

would cost little, and raw materials are a very small portion of pharmaceuticals' cost. Suppliers contribute to the quality of the industry's product, but the generally widespread availability of such chemicals renders this an unimportant force. In developing countries, the availability of standard high quality fine chemicals is not as prevalent, and any firm that could establish itself as such a supplier would be in a strong position relative to the drug manufacturers.

There has always been some threat of forward integration by suppliers, and some drug manufacturers began as chemical companies. This trend has intensified in the U.S. recently with Monsanto's purchase of Searle, for example. There is little likelihood of drug firms integrating backwards into fine chemical production. Sales to pharmaceutical firms are a very tiny portion of chemical company output, and the markets facing the two industries are quite dissimilar.

In sum then, suppliers appear to hold only modest power and are not in a position to intensify the rivalry of industry competitors (see Figure 2.24).

FIGURE 2.24

COMPETITIVE FORCES: POWER OF SUPPLIERS

		--	-	-0-	+	++	
# of important suppliers	Few			TF			Many
Presence of substitute inputs	Low				TF		High
Differentiation of inputs	High				TF		Low
Switching costs relative to firm switching costs	Low		TF				High
Total industry cost contributed by suppliers	Large fraction					TF	Small fract.
Suppliers' contribution to quality or service of the industry's products	High		TF				Small
Supplier's threat of forward integration	High		F	T			Low
Industry threat of backward integration	Low		TF				High
Importance of the industry to supplier group	Small		TF				Large
OVERALL				TF			

Availability of Substitutes

There are virtually no substitutes for pharmaceuticals. Prior to their development, people used folk remedies or were subjected to surgery. Within the industry, there are substitute products between competitors, of course, and these would have to be carefully examined to appreciate a particular firm's competitive posture (see Figure 2.25).

Summary of Competitive Forces

Overall the industry faces a moderate to favorable competitive environment, but in the years ahead I anticipate that it will become much less so (see Figure 2.26). Barriers to entry are lowering, making the threat of new entrants higher. Rivalry is intensifying as cost becomes an increasingly important competitive factor. Buyers are exerting more influence on the industry through institutional efforts to reduce or moderate health care costs.

FIGURE 2.25

COMPETITIVE FORCES: AVAILABILITY OF SUBSTITUTES

	-- - -0- + ++		
Availability of close substitutes	Large	TF	Small
User's switching cost	Low	TF	High
Substitute price value	High	TF	Low
OVERALL		TF	

FIGURE 2.26

SUMMARY OF COMPETITIVE FORCES IN THE PHARMACEUTICAL INDUSTRY

	Industry Attractiveness					
	1986			Future		
	Unfav	Med	Fav	Unfav	Med	Fav
Barriers to entry		X			X	
Barriers to exit		X			X	
Rivalry among competitors		X		X		
Power of buyers			X		X	
Power of suppliers		X			X	
Availability of substitutes			X			X
OVERALL		X		X		

Role of Governments and Societies in the Pharmaceutical Industry

The pharmaceutical industry is heavily impacted by social pressures and government actions throughout the world.

It is ironic, and a great source of frustration within the industry, that an industry geared towards improving human health should be so frequently maligned.

Attacks have arisen from several corners. One set surrounds the safety of drugs, and has led to significant regulation of the drug development and manufacturing processes by most governments. Another has resulted from concerns over the business practices of drug firms in developing countries, including questionable transfer prices and the marketing of inappropriate drugs. Successful pharmaceutical firms must address all these constituencies on a regular basis.

Governments in all countries with a domestic drug development capability regulate the process to some degree.[1] Most countries require pre-clinical testing in animals, followed by clinical testing in humans. Most countries, including to a limited degree the U.S., will accept test results from outside the country. A notable

[1] United Nations, Centre on Transnational Corporations, p. 139.

exception to this is Japan, which continues to require that most clinical tests be performed on Japanese. France also requires clinical testing be done in France. Such non-tariff trade barriers are hotly disputed within the industry and have made it expensive for multinationals to exert much role in these markets. Most countries require not just evidence of safety but also evidence that the drug works. Many proposals by critics of the industry suggest that not only should a drug work but work better than its predecessors before being authorized for sale. This is strongly opposed by the pharmaceutical manufacturers, even though it could have the effect of dampening competition. Most developing countries, such as Indonesia, India, Brazil, and Mexico, will accept a certificate of free sale in the country of a drug's origin as proof of a drug's legitimacy. This is not the case in the major drug markets -- the U.S., Japan, and the countries of western Europe -- although follow-on approval processes are simpler than the initial one in most countries (except Japan, as mentioned). Drug approval has become so difficult and time consuming in the U.S. that U.S. drug firms frequently first register and sell new drugs outside the U.S.

Governments are also involved in drug regulation after approving a drug for sale. The major markets

restrict and monitor sales via prescriptions. Most also require adverse drug reaction reporting and have provisions for handling product registration renewal or recall. Post marketing surveillance by governments is considerably less sophisticated in developing countries.

Governments have been increasingly involved with the business practices of pharmaceutical firms. This involvement ranges from labelling requirements to control of drug promotion to quality control in development and manufacturing.

In many countries, but most particularly the United States, product liability has become a major concern for pharmaceutical firms. Social and governmental pressures to guarantee the safety of drugs in all circumstances is limiting the amount of risk taking firms are willing to take. Some argue that the resulting conservatism will harm not only the industry's growth and profitability but consumers as well.

Government involvement in the industry also results from its role in providing for health care for its citizens. The U.S. government is one of the least interventionist compared to most other countries. In countries where the government provides medical care, either directly or through nationwide health insurance schemes, it is actively involved in setting prices and

determining which drugs will be purchased. The U.K., for example, has been active with drug firms in forcing down prices. The Japanese government is also highly active, and reduces drug prices of existing drugs on an annual basis. Its rationale, aside from the obvious economies involved, is to encourage innovation (new drugs receive much higher prices) and to increase the concentration in the industry by reducing the number of suppliers.

The World Health Organization in conjunction with several developing countries has developed an essential drugs list, and encourages countries to restrict procurement and manufacturing of drugs to this list. This is designed to prevent poor countries from spending money on expensive "unnecessary" drugs and to ensure unsafe drugs are not foisted off onto the poor countries.

Governments also play a role in the industry through their laws on the protection of intellectual property. Many countries recognize both product and process patents. A significant number recognize only process patents, but will not protect pharmaceutical compounds themselves. These include Spain, Eastern Europe, and most developing countries. Pharmaceutical companies object strenuously to this but appear to be gaining little support for their view that innovation will halt without such protection.

Governments in developing countries such as India, Indonesia, Brazil, and Mexico generally ban imports of drugs that are domestically produced. In such cases, government pressures lead to multinational firms investing in the domestic market themselves in order to guarantee their access to it. Once in a country, the government's policies often act to protect them. Many developing countries also limit the degree of foreign ownership in local firms as part of their overall development strategy. This poses the multinationals difficult problems of control. Countries such as India often aggressively favor locally owned firms in any event, also posing difficult problems for multinational drug firms.

Taken to the extreme, nations' demands for an indigenous pharmaceutical industry could eventually eliminate the international nature of this industry. Every country cannot be a net exporter of pharmaceuticals. This extreme case is not, however, likely. Developed country firms will become increasingly reluctant to transfer technology as competition intensifies, for example. Ignoring the nations' interests, though, is also not prudent. Trade as a proportion of consumption will probably decline. An export oriented strategy by either firms or countries is therefore risky, although an

appropriately targeted strategy would appear to be viable.

Without the impetus to spread R&D costs over as wide a base as possible, the actions of governments would almost certainly have been to restrict national markets to domestic firms. The widespread use of licensing between firms in different countries is a response to these difficulties. Overall, government actions on a worldwide basis are a major negative factor for firms competing in this industry. The trend is likely to continue to get tougher.

Technological Forces

Innovation has been the key to competitive success in the pharmaceutical industry since the second World War. The major source of innovation has been the drug firms as opposed to universities or government research laboratories. The pharmaceutical firms are still very much committed to the belief that innovation will also be their base for future success. In recent years, U.S. firms for example have rapidly increased their rate of R&D spending, and most management strategy statements out of the industry list R&D as their number one priority.

There is considerable evidence that the technology base and innovative process of the industry is shifting. More and more, the root cause (at the molecular level) of a disease or condition is being identified and a cure then derived. This, for example, is how Tagamet, the top selling anti-ulcer drug, is reported to have been developed.

Another force is the emergence of biotechnology as a significant factor in drug production. Biotechnology is not new to the industry -- fermentation for production of antibiotics is an example. What is new is the development of genetic engineering, in particular recombinant DNA technology. Much of the innovative effort has centered in new start up firms rather than in the traditional drug companies. Most of these start up firms have formed strategic alliances of one sort or another with large firms (particularly Japanese) to overcome the entry barrier of high costs associated with drug registration. It is taking longer for biotechnology to make significant headway than many predicted, but it nonetheless remains a powerful force of technology change in the industry.

There has been considerable concern voiced over the low rate of growth in R&D spending in the U.S. relative to the rest of the world. From 1973 to 1979, R&D expenditures in the U.S. grew at a real annual rate of

1.1%.[1] The European countries appear to have invested at increasing rates -- 4.8% per year for France, 7.9% for Germany, and 13.1% for the U.K. Japan's investment in R&D grew at a real rate of 8.1% during this period. Although Japan has traditionally not been an international player in the pharmaceutical industry, evidence points to its taking on an increasing role. This is reflected in Figure 2.27 which shows the dominance of U.S. R&D spending twenty years ago. By 1973, the U.S. share had dropped from 60 to 34%, with Germany, Switzerland, and Japan increasing their share of the world total dramatically. Through 1978, these patterns were intensifying, and Japan now contributes 15% of world R&D spending on pharmaceuticals compared to 28% by the U.S. It should be noted that Figure 2.27 is based on the country where the R&D occurs. Some of that R&D is performed by foreign owned firms. The difficulty of registering drugs in the U.S. has led some U.S. firms to locate R&D facilities outside the U.S., particularly in Europe but also in Japan. The world share of U.S. owned firms would be somewhat higher than that shown in the chart.

Many argue that the overall level of innovation has declined since the 1960's, and Figure 2.28 provides some evidence. About 85 new chemical entities (NCE's) were

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[1] Pharmaceutical Panel, p. 26.

FIGURE 2.27

PHARMACEUTICAL R&D EXPENDITURES BY NATIONALITY (LOCATION)

	1964		1973		1978	
	Level ($mill)	World share (%age)	Level ($mill)	World Share (%age)	Level ($mill)	World Share (%age)
United States	282	60	640	34	1159	28
Europe						
West Germany	40	8	310	16	750	18
France	28	6	166	9	328	8
Italy	15	3	82	4	147	4
U. Kingdom	29	6	105	6	332	8
Switzerland	38	8	244	13	700	17
Sweden	9	2	33	2	72	1
Netherlands	9	2	26	1	72	1
Japan	27	6	236	13	641	15

SOURCE: Pharmaceutical Panel, p. 25.

FIGURE 2.28

NEW CHEMICAL ENTITIES MARKETED WORLDWIDE BY PERIOD OF FIRST INTRODUCTION AND NATIONALITY OF INNOVATING COMPANY

	1961-64[a]	1965-69[a]	1970-74[a]	1975-84[b]	1985[c]
	(% of total)				
United States	24.5	22.0	23.0	24.8	28.3
Europe					
West Germany	16.0	11.5	8.5	13.2	7.5
France	17.5	22.0	19.0	13.2	7.5
Italy	5.0	7.0	6.5	8.3	11.3
United Kingdom	6.5	5.0	3.5	4.3	5.7
Switzerland	9.0	6.0	7.0	6.1	1.9
Japan	9.0	10.0	10.0	18.7	26.4
Rest of the world	28.5	16.5	22.5	11.4	11.3
Average number of NCE's per year	88	82	75	51	53

SOURCES: As noted below.
a Pharmaceutical Panel, p. 32.
b SCRIP 1062 (23 December 1985): 21.
c SCRIP 1063/1064 (25 December 1985): 10.

introduced on a worldwide basis each year in the 1960's. By the late 1970's, this had dropped to approximately 65 per year. Interestingly, the share of introductions by country of ownership of the new drug has changed very little, although Japanese firms have been very active at introducing NCE'S in recent years.

Economic Factors

Economic factors have only recently begun to be a critical influence on the pharmaceutical industry. Consumption per capita in all countries except Japan (at $113) was below $100 in 1980, with the U.S. at $55, Germany at $81, France at $92, and the U.K. at $38. Pharmaceutical consumption in the developed countries ranged from a low of 0.28% of GDP in Norway to a high of 1.45% in Portugal.[1] Drugs tend to be the only health care option in developing countries and are therefore a larger portion of total health care costs than in the developed countries.

Health care costs in the developed countries on a unit basis have grown rapidly, generally exceeding the overall rate of economic growth. That and the aging of many industrial societies' populations have resulted in

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[1] Burstall and Michon-Savarit, p. 48.

skyrocketing medical care costs. In the U.S., that has led to fundamental changes in the government's reimbursement of expenses incurred under Medicare. The private sector has also responded with changes in coverage under health insurance plans to motivate doctors and consumers to seek lower cost alternatives. To the degree that such expensive procedures as surgery can be replaced by drug treatment, this will benefit the pharmaceutical industry. This is not, however, the general case. The pressure to moderate health care costs has affected the drug industry and is squeezing profits.

The strength of the dollar has negatively affected the accounting income statements of U.S. based multinationals in recent years, and therefore reported earnings. The broad international base of these companies and the long term nature of their overseas activities would suggest that exchange rate volatility has little impact on the fundamental strength of these firms.

Strategic Implications

The pharmaceutical industry has been shaped by two important and, to some degree, interrelated forces over the last twenty years.

The first has been the increasing role of governments in all aspects of drug development and marketing. In the U.S., the 1962 Kefauver-Harris amendments introduced major changes in the regulatory process for drugs. Many of these changes have been adopted by other industrialized countries. At the same time, many countries were instituting national health insurance programs and state owned pharmaceutical firms (particularly in developing countries). The rising role of governments and the economic pressures throughout the world in the 1970's have led to considerable attention on drug costs, the second major force affecting the industry. The increased attention revealed that price differences for a given drug around the world were significant. That led to considerable pressure on the multinational firms to cut drug prices, including governments establishing price ceilings for drugs.

The increased regulation of the industry combined with an apparent plateauing of innovation, resulted in the multinational corporations diversifying out of drugs. Some diversified into entirely unrelated businesses while most entered other health care businesses. At the same time, these firms became increasingly reliant on foreign sales to cover the costs of product development. With many of the patents granted in the early years of

drug development expiring in the 1970's, generic drugs became feasible. With the pressures on drug costs, they were in demand.

In response to these forces, the industry has developed into two main streams. One is the traditional firms, with broadly diversified health care activities and specialized pharmaceutical products, operating on a worldwide basis. Another is smaller firms producing generic drugs and competing exclusively on cost. These smaller firms are becoming increasingly important in the industry and can severely threaten the more traditional firms with drugs subject to generic competition (i.e. those drugs with expiring patents). Firms based in moderately developed or less developed countries are an increasingly important part of this second stream because of their lower costs.

The external changes in the environment as well as the emergence of new groups of competitors suggests that changes in the strategic direction of the traditional firms are necessary if they are to sustain their past levels of performance. High rates of spending on R&D will no longer suffice.

With the continued growth in R&D costs, it remains important for specialized drug firms to distribute their patented product on as broad a scale as possible. This

means it is necessary for them to achieve distribution in Europe and Japan, and helpful to do so in developing countries. The time period to gain approval for a drug to be introduced as a new chemical entity is approximately eight years (in the U.S.; more or less elsewhere). Added to that is the time it takes to get approval and introduce a drug country by country. Regulatory requirements around the world have tended to extend rather than reduce this period. The increasing threats posed by "me too" and generic products dictate that firms must devise means to accelerate this process of drug approval and introduction on a worldwide basis if they are to be able to profit from their investments in R&D.

It is also essential for the traditional multinational corporations to seek to reduce their costs to be more competitive with the generic producers. When many of the existing multinational corporations argue that "production economies" are irrelevant to this industry, they are ignoring the reality of the emerging competition in generic drugs, both by developed country firms and ones in developing countries. Part of reducing cost is to revisit not just the portion contributed by production but also the costs incurred in the development process and by the distribution channels. Both of these are currently highly labor intensive. The emergence of small

biotechnology firms suggests that the traditional large R&D facility may be in strong need of overhaul. With the shift away from the doctor as customer, opportunities for new means of product promotion suggest themselves.

A third major implication of the environmental changes affecting this industry is the need for the traditional firms to develop new ways of interacting with national governments. Since the 1960's, U.S. and European firms have become increasingly dependent on business outside their home country borders. They have been willing to establish both product development and manufacturing facilities in foreign countries, for example. The inconsequential role of Japanese firms in the industry until recently can be accounted for partly by their unwillingness to extend their activities outside Japan.

The increased role of national governments in the regulation of drugs as well as in the direction of countries' economic activity in general puts new pressures on the multinational drug firms to tailor their actions to the country's needs. This is not to suggest that drug firms have been unresponsive in the past. To the contrary, they have been leaders in establishing worldwide product manufacturing and distribution.

The challenge they now face is to separate out those items that must be coordinated globally from those that must be tailored to the unique national environment. Research may continue to be globally coordinated, although potentially performed in more than one country. Some portions of development must be decentralized to individual countries to meet unique regulatory requirements. The history of producing the active ingredient in the home country and formulating the drug in small plants around the world may need to be altered. One approach would be to shift production of cost sensitive drugs to low cost countries and produce newer drugs in the industrialized countries. Such a shift in manufacturing would also entail changes in the patterns of product distribution, requiring more global coordination. Product marketing and promotion must remain tailored to the national environment, with appropriate attention paid to ensuring high ethical standards.

The pharmaceutical industry is an increasingly global one. Although non-tariff trade barriers have led to a wide dispersion of drug manufacturing capability, multinational corporations can no longer operate on a country by country basis. A world market is essential for cost recovery. The world medical community is fairly integrated, so with the exception of a few categories of

CHAPTER THREE

DOING BUSINESS IN CHINA: THE ECONOMIC AND POLITICAL CONTEXT

The forces acting on and within the pharmaceutical industry point to the desirability of achieving the broadest possible product distribution. They also call for firms to develop new ways to address the pressing economic, social, and technological concerns facing nations. Finally, they suggest that firms must pay particular attention to reducing costs throughout the value added chain.

Such general prescriptions are inadequate guides to action for firms approaching a given country, however. The decision on whether to attempt to do business and, if so, what form it should take, needs to be based on a full consideration of the opportunities presented by the country.

The next stage of review by a firm would normally be an analysis of the industry within the country. Such an

analysis could very well overlook the economic and political context in which the industry operates. In the case of a firm operating in its home country, the economic and political environment it faces is so familiar to it that specific attention may not be relevant.

The political and economic environment in China is not very familiar to foreign firms, however. Few have conducted business in China until recently. Because the context for doing business in China is so different from the traditional multinational firms' home countries, an understanding of it is crucial to firms undertaking investments there.

This chapter evaluates the overall economic and political forces within China which should be factored into a firm's decision to do business there. It also focuses on some of the practical aspects of conducting business in China that differ significantly from doing business in the industrialized countries. Some of these practices are not unique to China and may be familiar to firms with experience in other poor or centrally planned countries.

This chapter focuses on the general business environment in China and not on the pharmaceutical industry there. That is the role of the next chapter. Restricting discussion to the pharmaceutical industry at

this stage would overlook some important determinants of any investment decision.

Foreign firms must approach China with the realization that the government plays a very active role in the economy. A brief review of that role will set the context in which many of the obstacles foreign firms face can be better understood.

Since the establishment of the People's Republic of China in 1949, China has adopted a variety of approaches to economic development. Given the ideological orientation of China's leaders, these approaches have been intimately interwoven with political and social policies. The earliest years were characterized by reconstruction of the existing industrial base. This was followed by a period of close cooperation with the Soviet Union during which industrial development policies focused on upgrading China's heavy industry capabilities. When this period ended with the disruption of relations with the Soviet Union in 1960, China turned inwards but continued its efforts to industrialize. The Cultural Revolution shifted emphasis away from economic growth and individual gain to a more comprehensive implementation of socialism and moral development. As the influence of the Maoists receded, industrial development again became a priority.

China has followed a national objective known as the Four Modernizations for almost ten years. Although underlying policies have shifted, attention has been on modernizing agriculture, industry, defense, and science and technology. These are formally included in both the Constitution of the Chinese Communist Party adopted in August 1977 as well as China's National Constitution adopted in early 1978.

The first implementing vehicle for the Four Modernizations was the Ten Year Plan (1976-85) adopted in early 1978. The plan was extraordinarily ambitious. Industrial production's annual growth rate was set at 10%. It was also unbalanced in the sense that it called for major capital investment programs in traditional heavy industries. Agriculture ranked second as a priority, and light and consumer goods industries third. An important feature of the plan was that it announced that China would request both advanced technologies and assistance (including financial) from the industrialized countries in order to achieve its objectives.[1]

As Hua Guofeng lost favor, so did his plan, which was discarded by late 1978. The government shifted towards a program of readjustment, restructuring, consolidation, and

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[1] Jurgen Domes, The Government and Politics of the PRC: A Time of Transition (Boulder, Co.: Westview Press, 1985), p. 198.

improvement. Industrial growth was to be balanced between investment and consumption oriented production. The development of an integrated coherent industrial structure was to be sought, with more than just quantity as an objective. First priority was placed on the development of light and consumer goods industries, with agriculture second, and basic and heavy industries third.[2] These shifts were eventually incorporated into the Sixth Five Year Plan (1981-85) adopted in late 1982.

In this Sixth Five Year Plan, China continued to expand the scope of opportunity for foreign firms' involvement in China. A number of possibilities for a foreign firm exist:

a) licensing (technology transfer);

b) processing/assembling, with the work done for the most part within the Special Economic Zones;

c) compensation trade;

d) joint venture;

e) cooperative venture;

f) cooperative development.[3]

In the early years of these new opportunities, licensing and processing agreements dominated. As the laws

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[2] Ibid., p. 204.

[3] Samuel P. S. Ho and Ralph W. Huenemann, China's Open Door Policy: The Quest for Foreign Technology and Capital: A Study of China's Special Trade (Vancouver, British Columbia: University of British Columbia Press, 1984), pp. 29-30.

governing joint ventures have been clarified, these have become increasingly important, although not in sheer numbers.

A firm is not free to choose its form of investment on an arbitrary basis, however. The priorities for joint venture investment, for example, have been given as:

> a) light industry, textiles, foodstuffs, pharmaceuticals, and electronics;
>
> b) energy development, building materials, machine-building, iron and steel and chemical industries, offshore oil exploitation equipment;
>
> c) agriculture, animal husbandry, aquatic products;
>
> d) tourism and services.[4]

Since Ho and Huenemann wrote, priority has shifted to include aircraft, machinery, and instruments.[5] Within these industries, China seeks ventures that:

> 1) employ advanced technology and scientific management methods, increase product variety, and conserve energy and raw materials;
> 2) require small initial investments, have short gestation periods, and utilize existing enterprises as much as possible;
> 3) train technicians and managerial personnel; and
> 4) can export and earn foreign exchange.[6]

Initially, joint ventures were required to be exclusively export oriented. This requirement has since been relaxed. A firm approaching China with these items

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4 Ibid., p. 78.
5 Business China XI (28 February 1985).
6 Ho, p. 78.

to offer will find itself in a significantly better bargaining position than a firm without them.

Previews of the Seventh Five Year Plan, to cover 1986-1990, indicate that focus will be on moderate growth, cautious reform of the economy, and infrastructure development. Growth in industrial output is targeted at 7.0%, below the 8.6% annual performance between 1981 and 1984. Top priority will continue to be on energy, transportation, telecommunications, and raw materials development.[7]

With an understanding of the overall government policies applicable to a firm's decision to invest, it is appropriate to move to a detailed discussion of the specific obstacles firms face when attempting to do business in China. These obstacles are often characterized as risks. Risk, however, suggests that there is a "possibility of an unforeseen development. ... Risk as used here bears little relationship to the risk involved in games of chance. ... One might say there is statistical certainty in games of chance. In sharp contrast, the principal effort to deal with risk in social systems ... is to try to influence the probabilities".[8]

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7 Business China XI (7 November 1985).

8 Richard N. Cooper, "Managing Risks to the International Economic System" in Managing International Risk, ed. Richard N. Cooper (New York: Cambridge University Press, 1983), p. 23.

A similar definition applies in writings on political risk. Martin Shubik has written: "The very essence of risk is dynamics and uncertainty. If the individual is certain that taxes are high and will be collected, the facts of life may be unpleasant, but there is no risk."[9]

Many of what have been described as risks in doing business in China are not in fact risks as defined here but simply the country's business practices. Firms can considerably reduce the level of uncertainty they feel they face when doing business in China by thoughtful preparation and activities tailored to the environment. There is no denying that doing business in China is complex and time consuming, and that the long run rewards are not yet obvious.

Information alone can take away much of the uncertainty. Gaining information is no trivial matter, however. From 1959-1979, China published virtually no statistics. The State Statistical Bureau was reestablished in 1979 and has since done a good job of developing statistical data. As of two years ago, such information as the government budget, plans, production levels, monetary indicators, and trade were available,

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[9] Martin Shubik, "Political Risk: Analysis, Process, and Purpose" in Managing International Risk, ed. Richard N. Cooper (New York: Cambridge University Press, 1983), p. 110.

although local price lists and reconciled trade statistics were not.[10] That this continues to be a problem is evidenced by the publication of three different trade deficit figures for 1985.[11]

The most important problems facing foreign firms trying to do business in China can be divided into eight categories:

a) foreign exchange provisions of foreign investment regulations;

b) negotiations and decision making;

c) ownership issues;

d) infrastructural weaknesses;

e) access to local markets;

f) continuity of foreign investment regulations;

g) protection of proprietary information;

h) political stability.[12]

Over the last five years, the Chinese government has acted to reduce or eliminate the uncertainty associated with many of these risks. I would now like to move to a discussion of each of these. I will summarize the current

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10 China Business Review 10 (January/February 1983).

11 Wall Street Journal, 23 January 1986 reported that MFERT claimed the trade deficit was $7.6 billion (p. 34). On 14 March 1986, it reported that the State Statistical Bureau of China was claiming a $14.9 billion deficit, and the Customs Administration a $13.7 billion one (p. 34).

12 Adapted from Denis F. Simon, "China's Open Door to the West: The Emerging Climate for Foreign Investment," SLOAN (Winter 1985), p. 4.

status of each, and assess its relevance to foreign investors.

Foreign Exchange Provisions of Foreign Investment Regulations

Foreign exchange -- its availability and convertibility -- is an issue for firms conducting business of any type outside their own national boundaries. It becomes an especially difficult issue when doing business with countries experiencing trade deficits. Until 1984, China's imports and exports were roughly matched, and in some years exports exceeded imports by several billion dollars. In 1985, import growth greatly outpaced that of exports, and China ended the year with a trade deficit ranging from $7.6 billion to $14.9 billion. As a result, China's foreign exchange reserves dropped by several billion dollars. They remain quite high by most countries' standards, but a grave source of concern to the Chinese.

As a result of this "foreign exchange crisis", the government has imposed a series of import and foreign exchange restrictions. These include high import duties and taxes, holding up payments in foreign exchange, delaying expensive projects, curbing the spending

authority of local governments, and depreciating the currency.[13]

These have all obviously had an effect on foreign firms attempting to trade and invest in China. One method of payment which firms have been required to accept for imports to China is countertrade. This was a nuisance for firms to handle in the past because of the need to dispose of the items countertraded. By 1985, however, both Chinese import export companies and U.S. trading companies were serving as intermediaries to help sell the unwanted goods.[14]

Investors in joint ventures have always been required in principle to balance their foreign exchange requirements.[15] This means that the venture must earn enough foreign exchange to cover imported materials and equipment, expatriates' salaries, and profit remittances. There are in theory exceptions made in the case of joint venture products urgently needed in China or usually imported anyway. Jeanne Chiang points out though that "rare indeed is the foreign company that manages to take

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13 John Stuermer, "The Foreign Exchange Situation," China Business Review 13 (January/February 1986): 14-17.

14 Business China XI (10 January, 14 February 1985).

15 Zou Siyi, "How to Do Business with China," China Business Review 12 (January/February 1985): 12-13.

foreign exchange out of China by some means other than exporting".[16]

Investors are normally expected to generate foreign exchange through the export of products made by the joint venture. To date this has been rigidly interpreted by the Chinese. Foreign partners buying other products from China were not allowed to offset these transactions against their joint ventures' foreign currency requirements, for example. Earlier this year, the Chinese government announced that it was considering two proposals to ameliorate the foreign investors' problems. One was to allow foreign firms to channel Chinese currency earnings to export oriented Chinese factories and share in their foreign exchange profits. Although not specified, this would almost certainly cost the foreign firms a premium. The second proposal would let foreign investors consolidate their joint venture projects, enabling them to offset the foreign exchange deficit in one with a surplus in another.[17]

Given the availability of foreign exchange, the board of directors determines the distribution of after-tax profits. Joint ventures must apply to the Bank of China to remit after-tax profits and to the State General

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[16] Jeanne Chiang, "What Works and What Doesn't," China Business Review 10 (September/October 1983): 31.

[17] Wall Street Journal, 3 January 1986.

Administration of Foreign Exchange to remit capital funds out of China.[18] In April 1985, foreign banks were authorized to set up branches in the SEZ's to handle, among other things, remittances to foreign firms.

The continuing devaluation of the currency poses problems to foreign firms. Currency devaluations can have a positive or negative effect on the economic profitability of a firm, depending on the structure of its operations. For a firm with a joint venture producing for the Chinese market, a devaluation offset by inflation (and therefore increased product prices) causes minimal economic exposure. The same is true for firms which are largely export oriented (i.e. export earnings would remain unchanged; costs in China would rise but be offset by the currency devaluation). The most troublesome situation for firms would occur when their venture depends on imported materials and domestic distribution and prices are not allowed to inflate when the currency devalues. This is a real source of risk for firms doing business in China and characterizes the situation of many of the pharmaceutical joint ventures. The conventional hedging options -- local currency borrowing and forward contracts -- are not, as I understand, available.

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[18] Ho, p. 88.

The implications for firms seem clear. Firms prepared to export at least some of the output of the joint venture will be in the best position. Firms seeking access to the local market face exchange risk from the likely "stickiness" of local prices in the event of currency devaluations. Mechanisms to minimize the resulting exchange loss should be developed as part of the business decision to invest.

Negotiations and Decision Making

The Chinese are tough negotiators by all accounts. An initial difficulty for the foreign firm is determining who in fact has decision making authority. A second issue is the way in which decisions are made and negotiations conducted. The resolution of issues after an agreement has been reached can also be problematical. A final obstacle to timely closure is home country export laws, particularly those of the U.S.

Increasing amounts of information on the structure of the bureaucracies in China are becoming available. In addition to the state bureaucracy there are 29 province level bureaucracies, including those of three municipalities (Shanghai, Beijing, and Tianjin). There are also local level organizations with the authority to

promote foreign investment, in addition to the provinces and municipalities. These include the Special Economic Zones (Shantou, Shenzhen, Xiamen, and Zhuhai) and two coastal cities (Dalian and Guangzhou).[19] Since investments can be undertaken by all these groups, weaving through the maze of interrelationships can be difficult. With the spin-off of the foreign trade corporations and state run import-export companies in 1985, who has authority for what products has become even more complex.[20] Business periodicals regularly publish organization hierarchies and some members of the academic community have developed them.

Although it no doubt takes effort to identify relevant players, the nature of the bureaucracy is certainly not unique to China. Graham Allison described bureaucratic behavior as one of his three models of decision making in organizations:

> The decisions and actions of governments are intranational political resultants: resultants in the sense that what happens is not chosen as a solution to a problem but rather results from compromise, conflict, and confusion of officials with diverse interests and unequal influence; political in the sense that the activity from which decisions and actions emerge is best characterized as bargaining

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[19] In April 1984, fourteen coastal cities, including Shanghai, Tianjin, and the two named, were given the authority to encourage foreign investment. Since then, development of ten of these has been put on hold. Likewise, Hainan island's special treatment has also been withdrawn. China Business Review 12 (September/October 1984): 4-5.

[20] Business China XI (10 January 1985).

> along regularized channels among individual members of the government.[21]

There is no reason to believe that the Chinese bureaucracy behaves fundamentally differently from the model described by Allison. Leadership in bureaucratic organizations can do little more than cause small shifts in the balance of power within the bureaucracy. As Richard Bush and Michel Oksenberg point out in the case of China, "orders issued in Peking are not always swiftly or totally obeyed".[22] Likewise, the government bureaucracy tends to have a life of its own. In 1984, for example, it ran more than 40% over its approved budget.[23]

The bureaucracy has been identified as a problem by Chinese leaders and a number of administrative reforms have been initiated. These include renewed emphasis on moral education to popularize the participative management style. Vigilant law enforcement of anti-corruption measures is occurring. Overstaffing and duplication is being reduced in both the state, party, and province level organizations. The personnel system is being reformed to improve recruiting, performance evaluation, and training. Administrators are to be held responsible for their

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[21] Graham T. Allison, Essence of Decision: Explaining the Cuban Missile Crisis (Boston: Little, Brown & Co. 1971), p. 162.

[22] Michel Oksenberg and Richard C. Bush, "China, 1972-1982: From Revolution to Reform," in China Briefing, 1982, ed. Richard C. Bush, p. 20.

[23] Business China XI (15 August 1985).

actions.[24] In spite of these reforms, John Burns feels bureaucratic reform will be constrained. Scarcity of material and human resources will continue to encourage corruption. The limitations of a single approved management style (i.e. participative) are vexing, as is the continuing need of the party to maintain political control. A final constraint he identifies is the pursuit of unit interests and the pervasiveness of "guanxi", the informal but powerful networks of personal relationships. Kenneth Lieberthal adds to this list of constraints the traditional career patterns of bureaucrats, which restricts them to a single unit or closely related units. The cultural trait of consensus reinforced by the harsh penalties inflicted for individualism in China over the last forty years exacerbates the problem of reform. These hesitations appear to be born out by the very limited success the reform measures appear to have had.[25]

The implications of this bureaucratic behavior for the foreign firm are that it must seek to stay abreast of relevant groups within the bureaucracy. It must be careful not to forge specific alliances at the expense of its relations with other groups.

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[24] John P. Burns, "Reforming China's Bureaucracy, 1979-82," Asian Survey XXIII (June 1983): 692.

[25] Kenneth Lieberthal, "Political Reform," China Business Review 10 (November/December 1983): 10-13.

Once a group has been identified to work with, negotiations can be undertaken in earnest. The Chinese prefer to begin negotiations by agreeing on some overriding principles, usually embodied in a memo of understanding, with the action plan for proceeding spelled out in a letter of intent.[26] U.S. firms have unwittingly assisted in this with corporate Chief Executive Officers frequently being the first in the firm to engage in talks with the Chinese.

Once the general principles have been agreed to, discussion can move to the details of the agreement. The Chinese use negotiations to gather information, particularly of a technical nature. Firms may find themselves disclosing more and more information about the product and process under discussion. It is important that they make a conscious decision on how much they are willing to disclose prior to an agreement being consummated. After the technical sessions are concluded, the contractual discussion on terms of agreement is conducted. A firm must be prepared to spend a significant amount of time and money to complete these negotiations. For this reason, large multinational corporations are often felt to have an advantage in coming to an

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[26] This section taken largely from Lucian Pye, Chinese Commercial Negotiating Style (Cambridge, Mass.: Oelgeschlager, Gunn & Hain, Publishers, Inc., 1982).

agreement. Once an agreement has been concluded and agreed to, it must get the necessary government approvals, such as MFERT's. After those approvals, the contract and articles of association for a joint venture would be drawn up, signed, and sent to the government for a business registration number.

In terms of negotiating tactics, the Chinese are very skillful at using their role as hosts to control the timing of meetings, to arrange agendas, and to determine the pace of the negotiations.

The Chinese do not treat the signing of a contract as signaling a completed agreement. They view the relationship in a longer term and less episodic fashion. To them, an agreement does nothing more than set the stage; likewise canceling an agreement is not intended to signal the end of a relationship.

Lucian Pye summarizes what he regards as the rules for negotiating with the Chinese:

> (1) practice patience;
> (2) accept as normal prolonged periods of no movement;
> (3) control against exaggerated expectations, and discount Chinese rhetoric about future prospects;
> (4) expect that the Chinese will try to influence by shaming;
> (5) resist the temptation to believe that difficulties may have been caused by one's own mistakes; and
> (6) try to understand Chinese cultural traits, but never believe that a foreigner can practice them better than the Chinese.[27]

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[27] Pye, p. xii.

Foreign firms do not need to be at a total disadvantage during negotiations, of course. They have power derived from their technology, their financial resources, and, at times, the competition between governmental bodies for foreign investment. While frequently frustrating, there would appear to be few uncertainties associated with the negotiation process that cannot be eliminated by careful planning.

When firms began conducting business in China in the 1970's, the only dispute settlement mechanism was through the Chinese government. This inevitably caused some anxiety for foreign firms. The 1979 law on joint ventures allowed for arbitration by a mutually agreed to party, not necessarily in China. The Chinese have also agreed to follow international arbitration rules.[28] Writing in 1983, Ho and Huenemann felt that "on the whole, the laws and regulations concerning joint ventures provide a framework that most foreign investors can live with."[29] Authors since then have provided further details of the dispute resolution processes.[30] Little has been written on firms' actual experiences in seeking to resolve disputes, however.

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28 Ho, p. 89, 207.
29 Ibid., p. 89.
30 Pitman B. Potter, "Resolving Conflict Disputes," China Business Review 11 (September/October 1984): 21-23.

A major deterrent for U.S. firms doing business in China is the process of gaining approval for technology exports from the U.S. In 1980, China was shifted from having the same export controls as the U.S.S.R. to its own unique category. In 1983, it was moved to the category including NATO allies. Nonetheless, items capable of being used for military purposes as well as civilian are subject to additional scrutiny both within the U.S. and by the Coordinating Committee for Multilateral Export Controls (COCOM). COCOM is an international body chartered to review technology sales to communist countries. It adds 45 to 120 days alone to the decision making process.[31] In late 1985, COCOM significantly liberalized its controls over many goods sold to China, including computers, telecommunications equipment, and medical devices. The changes are anticipated to reduce the number of applications to export goods to China requiring COCOM approval by about half.[32]

Although foreign firms are likely to find the decision making process associated with doing business in

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[31] Chris Brown, "Export Controls," China Business Review 10 (July/August 1983).

Madelyn C. Ross, "Export Controls: Where China Fits In," China Business Review 11 (May/June 1984): 58-62.

Larry W. Roeder, Jr., "High Technology Sales to China: the COCOM Connection," China Business Review 11 (January/February 1984): 7.

[32] China Business Review 12 (November/December 1985): 4.

China very slow, it also seems reasonably predictable with careful planning and a willingness to wait.

Ownership Issues

The importance of issues surrounding the rights and obligations of ownership are a direct function of the level of invested capital. Many of the special trade arrangements firms can make with China do not result in substantial direct investment so do not encounter this particular class of problems. Joint ventures by their nature do. The 1979 joint venture law specified that the proportion of the investment contributed by the foreign participant should be at least 25 percent. Wholly owned subsidiaries of foreign firms are now allowed.

As many writers on multinational corporations have pointed out, "host countries are becoming increasingly aware that there is often a clear distinction between ownership and control in international business".[33] In many developing countries, control by the host country is difficult to achieve. In China, a level of control acceptable to the multinational corporation may in fact be

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[33] Including Constantine V. Vaitsos, "Government Policies for Bargaining with Transnational Enterprises in the Acquisition of Technology," in Mobilizing Technology for World Development, ed. Jairam Ramesh and Charles Weiss, Jr., p. 102.

difficult. This arises largely from the economic, social, and political context in which the firm is operating. The concept of firms as independent, self guided entities subject to few constraints other than that of profitability is not operative in China. Firms operate within a highly bureaucrat structure with staff poorly prepared or motivated to initiate significant change.

As a starter, joint ventures are not free to unilaterally determine what products to produce, how to produce and distribute them, and in what quantities. Although the joint venture initiates its plan, it is contingent upon the availability of resources and the approval of the Chinese authorities governing it.

One of the major sources of concern to foreign investors is labor management and the freedom of the joint venture to select, discipline, and motivate employees. The problem extends from the most senior Chinese managers of the firm to production and support personnel. Chinese law has given joint ventures the right to select workers on the basis of examinations. Surplus workers may be terminated although severance pay is required. Employees who violate rules and regulations of the joint venture may be disciplined or dismissed. Approval for such dismissals by higher authorities is required, however, which is difficult to get without active support by the Chinese

board members. Although there have been a few precedents established for both layoffs (for example, Fujian Hitachi laid off 100 in 1983) and firings (for example, the Jianguo Hotel fired 3),[34] firms find it difficult to enlist support for disciplinary action from either the board or management. The scars from the Cultural Revolution have resulted in a great reluctance to take personal risks in differentiating people's performance.

Western firms are accustomed to using money as a major means by which to motivate managers and employees. Although the joint venture may establish its own wage and bonus system, there is a fairly low ceiling on the maximum amount workers may be paid (no more than 150% of that earned by employees of state owned enterprises). The Chinese frequently ask during negotiations that top Chinese managers be compensated equivalently to their foreign counterparts. Western firms resist this because of the high costs associated as well as the generally lower skill and experience level of these managers. Such high salaries do not, of course, accrue to the manager himself or herself but go to the government. Even though there appears to be more leeway for incentive pay in a joint venture than in a state run enterprise, firms

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[34] Jamie P. Horsley, "Chinese Labor," China Business Review 11 (May/June 1984): 16-25.

frequently find that managers are unwilling to use it to differentiate employees' contributions.[35]

Employees are represented by a trade union which negotiates the preceding items as well as working conditions on their behalf. Trade unions are characterized as being quite powerful. The Communist Party is reported to be playing a diminished role in joint ventures compared to its traditional role in state run enterprises. It apparently does not have the right to establish an independent organization within the firm, for example. It does, however, operate behind the scenes to provide ideological supervision, undertake political work, and ensure that workers and managers observe China's laws, regulations, and policies.[36]

In the early 1980's, the Chinese government promoted a style of management characterized by John P. Burns as the "mass line" theory of leadership.

> The style values trust, honesty, and openness between superiors and subordinates in organizational hierarchies and among colleagues. Close ties to the masses, relying on the masses, and demonstrating concern for their welfare are all part of the approach. Decision making should be shared and participative, leaders exercising their authority through friendly persuasion in a friendly and comradely manner. Commandism or the use of coercion is expressly forbidden. Leaders should share the life and work of their subordinates to limit the effects of hierarchy.[37]

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35 Andrew G. Walder, "Rice Bowl Reforms," China Business Review 10 (November/December 1983): 18-21.

36 Horsley, pp. 16-25.

37 Burns, p. 700.

The foreign partner in one joint venture painted a negative view of this style in practice: "middle level managers lack initiative and spend forever compromising instead of going out and doing the job".[38] The Wall Street Journal also painted a different picture of Chinese management styles in describing the Chinese takeover of a Hong Kong firm, Conic Investment Co. The new P.R.C. Chinese board was characterized as "conservative, bureaucratic and inflexible".[39] Some firms have found it helps to clearly specify in the contract the responsibilities of each key managerial and technical position within the joint venture.[40] To the degree that the officially sanctioned approach is not flexible enough to handle unique situations, it may represent a problem to the foreign investor.

Overall the laws and regulations for joint ventures permit an appropriate level of foreign control. In practice, such control is likely to be difficult to attain. Most joint ventures are less than three years old so have barely had an opportunity to "settle in". This remains an area of considerable uncertainty for the foreign investor.

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[38] Business China XI (29 August 1985): 122.
[39] Julia Leung, "Peking Turns a Hong Kong Firm Around," The Wall Street Journal, 20 November 1985, p. 34.

Infrastructural Weaknesses

China's industrial infrastructure is very weak and can pose many problems for a foreign firm. Basic physical infrastructure -- communication system, transportation network, energy (especially electricity), and water supply -- is marginal. The price system in no way reflects demand and supply. The lack of physical infrastructure and standard market mechanisms leads to supply disruptions and quality problems.

The state is currently allocating approximately one third of its capital budget to the communication, transportation, and energy sectors.[41] Eventually, these investments will yield benefits. In the short term, however, these areas pose considerable constraints to business activities.

The current telecommunications system depends heavily on open wire and microwave transmission. In 1983, China had one phone for every 300 people, while the U.S. had one per person.[42] China plans to add three new satellites, including one by 1985 to improve voice and data transmission. It is putting digital exchanges in urban

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40 Business China XI (29 August 1985).
41 Business China XI (14 March 1985).
42 China Business Review 10 (January/February 1983).

areas and establishing fiber optic links between cities.[43]

Transportation is also a constraint. The railway, road, and waterway networks are inadequate to handle today's transportation requirements. What is worse, their capacity is growing at a slower rate than industrial output.[44] Work is underway to increase the handling capacity of China's ports. Railway expansion is focusing on providing more and better service to bottlenecked areas rather than extending coverage to remote regions. Some have suggested that air travel is the only short term workable method for increasing transportation capabilities. Many of the improvements planned for transportation should be in place by 1990.

The supply of energy, and electricity in particular, is below the level required. Cheng Chu-yuan noted that the shortage of electricity in the late 1970's idled 20 to 30 percent of industrial capacity.[45] Increasing the supply of electricity is infeasible in the short term. To address the problem, emphasis has been shifted away from

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[43] China Business Review 11 (January/February 1984).

[44] John M. Pisani, "The Big Seven," China Business Review 10 (January/February 1983): 14-26.

Martin Weil, "The Two Faces of Chinese Rail Technology," China Business Review 11 (September/October 1984): 24.

[45] Cheng Chu-yuan, China's Economic Development: Growth and Structural Change (Boulder, Co.: Westview Press, 1982), p. 439.

energy intensive industries to light and consumer oriented industry. Although there is scope for using the available supplies of energy more efficiently, this frequently requires considerable capital investment. The goal of saving energy also runs into conflict with the goal of emphasizing consumption. Longer term, the Chinese are investing in the expansion of their energy capabilities, so that by the year 2000 total production of energy should be double 1981 levels.[46] Ho and Huenemann conclude that while the projected output increases are feasible, the increases in efficiency of energy usage required to ensure an adequate supply overall are questionable. Energy shortages could therefore plague China for 20 or more years. For example, in the first half of 1985 (compared to first half 1984), industrial output grew 23% and energy only 11%.[47] In these circumstances, firms must be very prudent to ensure energy supplies are negotiated with the appropriate supply ministries before the conclusion of an agreement.

These problems with physical infrastructure can pose a number of problems to foreign firms. One is in terms of actual disruptions to ongoing operations -- for example, power interruptions -- which affect output, costs, and therefore profits. Other effects can be more subtle. A

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[46] Ho, p. 145.
[47] Business China XI (15 August 1985).

lack of construction material can delay the start up of physical plant. Suppliers may not be able to deliver because of lack of transportation for their goods. The venture may not be able to adequately distribute its production without the ready availability of telecommunications capability to communicate with consumers. The headquarters of the foreign firm may be frustrated by its isolation from the venture arising from such weaknesses. Such problems are prevalent throughout the poor countries of the world, and most multinational firms are accustomed to working around them.

The price system does not reflect an equilibrium balance between demand and supply. At one time, virtually all prices were established by the state. Over the last few years, it has gradually relinquished some control, although it retains it for key commodities and controls the degree of variation for others. The result of such relaxation has been the emergence of a large black market as well as price inflation. Because price changes affect everyone, genuine price reform is very tough politically.[48]

Without efficient prices, resources are misallocated. Factories are encouraged to produce poor quality products that may not be demanded, motivated by artificially high

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[48] Thomas P. Bernstein, "China in 1984: The Year of Hong Kong," Asian Survey XXV (January 1985): 33-50.

prices. These price imbalances affect foreign firms, who at times are required to use international prices (for exported products using Chinese materials) and at other times domestic prices (for internally distributed products). It also makes the true evaluation of profitability a difficult undertaking. A further deficiency of the pricing system and the lack of equilibrium interest rates is a tendency to over invest. This reached critical proportions in 1982. It was not until 1983 that the government's administrative actions were able to curb it.

The weaknesses of the physical infrastructure and pricing mechanism lead to the unreliability of Chinese suppliers as well as quality problems. Putting aside quality problems arising from pricing system quirks, good quality appears to result from thorough training and a clear definition of what is and is not acceptable.[49]

The risk to a firm of these infrastructural deficiencies depends to some degree on the nature of its product and processes as well as its location. A firm producing bulky, heavy products requiring large amounts of energy in its processes would be well advised to steer clear of China. Likewise, firms should not establish

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[49] Chiang, pp. 26-28.

operations in China only to take advantage of the pricing system anomalies.

Access to Local Markets

Access to local markets of all types continues to be a major constraint to firms doing business in China. The markets are not just those for output but also include the markets for inputs, including raw materials, capital, and labor.

Most forms of special trade with China require the foreign firm to supply some of the physical resources required. In most cases, its responsibility is to provide production equipment, but in processing/assembling agreements it is also required to provide raw materials.

When a firm is dependent on internal markets either for inputs or to sell its outputs, it is critical that it evaluate them carefully. More importantly, it is fundamental that the investment agreement clarify the responsibilities for future problems that may arise with regard to market access.

Since access to China's large population is a goal of many foreign firms in investing in China, it would seem only prudent that firms take an active role in assessing the size of the market and the extent of their access to

it. This proves to be much more difficult than it sounds. For one thing, information on markets for products new to China is extremely difficult to gather. Secondly, the Chinese partner is generally a production enterprise, and has no experience with product distribution, much less marketing. Relying on the state distribution system, often a necessity, is problematical. Who determines whose products are distributed, and in what quantities? Foreign firms have thought they were to have the only product of its type in China, only to discover agreements have been signed with their competitors as well.

The markets for industrial goods continue to be dominated by the state planning and allocation process, although to a lesser degree than before. In 1984, the State Planning Commission controlled 265 commodities; in 1985 the plan was for it to control only 65.[50] Dependence on these markets for inputs to the production process is risky unless well spelled out in the contract. If the investment is in a high priority sector, the risk of a supply interruption is less. If the firm's outputs are industrial products, the problem of product distribution disappears as it is all handed over to the appropriate ministry.[51]

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50 China Business Review 11 (September/October 1984).
51 Bernstein, pp. 33-50.

The internal market for acquiring other materials can be significantly more complicated. The government is encouraging firms to establish contracts with each other for output distribution. This could logically be expected to improve reliability of sources since accountability is closer to the supplying firm. Early experiences with this in China, though, have been mixed, and supply continuity remains a legitimate concern for foreign firms. Another means to acquire materials is through trade centers, 2200 of which have been set up as of March 1985.[52]

Another major market issue facing foreign firms is that for labor. Labor is generally arranged through labor companies at the local level. A contract is signed with the labor company, and employees' salaries are paid to the company, which then disburses a portion to the employees themselves.

The supply of skilled and semiskilled labor in China is severely constrained, and is likely to continue to be. The lowering of standards, intimidation of intellectuals, and general disruption of academic institutions during the Cultural Revolution has resulted in a major portion of the population having an inadequate educational background for many jobs. The government has adopted policies to raise educational levels, but these will take years to reap

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[52] Business China XI (14 March 1985): 36.

benefits. The government has instituted a number of measures:

a) the reinstitution of entrance examinations to colleges and universities;

b) the use of examinations to evaluate job candidates and determine promotability;

c) the use of education programs aimed at large groups (through TV, in factories, etc.).[53]

The capacity of the educational system is also being expanded. The enrollment in middle schools in 1979 was 63 times as great as in 1949. Vocational schools and institutes of higher learning could each handle seven times as many students in 1979 as in 1949. Since the formal schools are inadequate to handle needs, diverse methods of education have been implemented, ranging from self-study programs to TV-based universities. These changes will all, no doubt, improve the skill level of the labor force over time.

Another skill in short supply is that of managerial talent, whose development has been generally ignored in the past. Many general managers of medium sized enterprises have no professional training, for example. In 1979, the Chinese Enterprise Management Association was

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[53] Rosalie L. Tung, "Chinese Mentality and Outlook Toward Work and Industrial Progress," Chinese Industrial Society After Mao (Lexington Books), pp. 112-113.

established to improve the quality of management and has a number of programs underway to do so.[54]

It is not in China's interest to have its very best people in the employ of foreign firms and their joint ventures. Based on experiences in other countries, this tends to minimize the transfer of technology and to encourage brain drain. If a firm is dependent on significant levels of skilled (especially uniquely skilled) individuals, it runs the risk of not being able to meet future staffing needs or the disgruntlement of the government.

It is also important to realize that the labor market is not as flexible as that in the U.S. Workers have some opportunities to relocate, but the Chinese government is committed to full employment. Although there are currently large numbers of people in urban areas awaiting a job, they generally lack the skills a foreign investor would require. Agreements on labor supply (including skill levels and follow-on requirements) are essential prior to a foreign firm's full commitment to doing business in China.

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[54] Tung, pp. 134-136.

Continuity of Foreign Investment Regulations

The regulations governing foreign investment have become much more explicit and their execution much more predictable in recent years. When it was first announced that foreign participation would be sought to assist in China's development, China had no legal framework or experience to guide it. The Law on Joint Ventures Using Chinese and Foreign Investment was adopted in July 1979. Since China had no company, contract, or commercial law at the time, the initial law was by necessity less than comprehensive.[55] Up to 1983, several laws and regulations were passed to provide a legal and economic framework to guide business dealings in China. In late 1983, several new regulations concerning joint ventures were instituted and the tax law was changed. In 1984 a U.S. China Income Tax Treaty was approved moving China closer to international tax practice and clarifying several open issues on individual and firm tax treatment.[56] In 1985, accounting rules for joint ventures, based on international principles, were established.[57] In the same year, regulations governing

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55 Ho, p. 75.
56 China Business Review 11 (September/October 1984).
57 Business China XI (11 July 1985): 97.

the import of technology were issued,[58] as well as laws on economic contracts involving foreign interests.[59]

Although the regulations are considerably more detailed than they were just five years ago, there has been an inadequate amount of time since they were promulgated for businesses to understand how they will be implemented. The cancellation in 1981 of seventeen large-scale projects, for some of which contracts had already been concluded with foreign firms, was unsettling.[60] The rationale for these cancellations (a result of the shifting of national priorities away from heavy industry) was no solace. There have been other incidents of unpredictable government actions since. In 1985, for example, as China's foreign exchange reserves dropped, a number of import duties and controls were applied. In some cases, they came earlier than anticipated.[61] In other cases, controls were applied even where contracts with foreign firms stipulated other provisions.[62] In May 1985, a tax law for foreign representatives' offices was implemented, retroactive to January 1985.[63] The Ministry

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[58] Ellen Eliasoph and Jerome Alan Cohen, "China's New Technology Import Regulations," China Business Review 12 (November/December 1985): 50-54.

[59] Jerome Alan Cohen, "The New Foreign Contract Law," China Busines Review 12 (July/August 1985): 52-55.

[60] Domes, p. 203.

[61] Business China XI (24 January 1985).

[62] Business China XI (10 October 1985).

[63] Business China XI (30 May 1985).

of Foreign Economic Relations and Trade also began to scrutinize the foreign exchange balancing requirement for equity joint ventures more carefully.[64]

Many of these actions appear arbitrary on the surface. Further investigation, however, identifies the underlying rationale. Most were motivated by the foreign exchange reserve drop, but some arose from efforts to flesh out existing regulations. A firm following the economic developments within China should be in a position to anticipate these changes. Some have suggested that the contract (in the case of joint ventures) include a provision for the Chinese partner to pay for duties imposed after contract agreement.[65] In spite of such protective clauses, this remains an area of some uncertainty to the foreign investor. It would appear, however, that foreign firms can look forward to greater continuity of foreign investment regulations in the future, if only through a build-up of experience on both sides.

Protection of Proprietary Information

One of China's highest priorities for foreign investment is the transfer of advanced technology and

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64 Business China XI (25 July 1985).
65 Chiang, pp. 26-28.

management methods. While this can represent an opportunity for a foreign firm, it can also create considerable tension over control of proprietary information. In March 1984, a patent law was passed, to become effective in April 1985. In December 1984, China accepted the Paris convention for the protection of industrial property. The patent law serves to encourage the transfer of technology by foreign firms as well as to provide monetary rewards for Chinese inventors.

Only new inventions are covered by the law. It excludes those filed elsewhere as well as those publicly disclosed prior to filing. Patents are valid fifteen years.[66] In the case of chemicals, which includes pharmaceuticals, patents can only cover processes but not the composition.[67] There are apparently some indications that formulations of chemicals as well as processes may be covered in the future. There is also apparently some potential that China will patent the microorganisms as well as the processes for producing them that are associated with biotechnology.[68] The law provides few insights into the punishment for violations. The same uncertainty exists in the case of the rules established in

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66 Business China XI (10 January, 14 February 1985).
67 China Business Review 11 (March/April 1984).
68 Ellen Eliasoph, "China's Patent System Emerges," China Business Review 12 (January/February 1985): 50-54.

May 1985 to cover technology transfers.[69] Since the law is so recent, there have been no precedents established in terms of its enforcement, and it remains a source of uncertainty for a firm whose patents represent a significant asset.

More important than the details underlying the Chinese legal provisions regarding intellectual property are the very different objectives of Chinese and foreign investors with respect to technology. China is seeking technology from foreign firms; foreign firms are seeking product markets. A foreign firm that anticipates long term market access (and profitability) from a one time technology transfer is overlooking China's real objectives. Given that China continues to be mainly technology focused, firms are likely to find themselves under continuous pressure to transfer technology. Failing to do so could well reduce a firm's prospects of profits. Firms should not enter a business relationship with China without recognizing that and accommodating their plans accordingly. Otherwise, they are likely to end up with either no business in China or having "given away" more than they intended.

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[69] Business China XI (13 June 1985): 84.

Political Stability

The current focus of discussions on political stability in China revolves around the question of succession. Deng Xiaoping is 81 years old and other current leaders are equally aged. Deng has, however, gradually relinquished immediate authority over a number of Party and State bodies, remaining only as the Chairman of the State Central Military Commission. This summer, a number of Party Politburo members were shunted aside and were replaced by younger leaders. The average age of the Standing Committee has dropped by one year (to 74.6 years old) since 1983 and the Politburo as a whole by five years (to 68.9 years old).

In a country that is oriented towards a single leader, the fact that no successor to Deng has clearly been identified remains a source of concern. Some authors have downplayed this concern by suggesting that China is in transition to an institutionalized state such as exists in the U.S.S.R. "The preponderance of single individuals and the consequent importance of solving top leadership succession questions will continue to lose its relevance."[70] In contrast to this view, Oksenberg and Bush have taken a historical perspective to assert that

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[70] Eberhard Sandschneider, "Political Succession in the PRC: Rule by Purge," Asian Survey XXV (June 1985): 658.

China has always had a single leader when unified. They wonder whether shared power would really work.[71] Depending on when the initial succession takes place, a second succession could occur within a short period of time because of the age of the individuals.

Writing in 1984, Jurgen Domes identified four groups from which China's future leadership could emerge:

a) The military leaders during the end of the civil war and the Korean War. They will almost certainly be the People's Liberation Army's next leadership generation.

b) The people who studied in the Soviet Union and Eastern Europe during the 1950's.

c) The individuals who led the rural mobilization efforts of the Great Leap forward.

d) The leaders and activists of the revolutionary organizations during the Cultural Revolution.

Domes concluded that while consensus is likely to be reached by the current generations in office, the future leadership groups' diverse backgrounds would make it hard to achieve more than "superficial consensus, if any at all".[72]

Other writers have pointed out that the current government's pragmatic approach has led to many internal

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71 Oksenberg, pp. 11-27.
72 Domes, p. 240.

cleavages. The economic agencies have gained power, but the CCP propaganda department, the ministry of public security, and the military have lost.[73] There are generational differences, with youth being frequently described as anti-ideological.[74] The disparities between the urban and rural areas could create tensions, as well as coastal and interior differences in living standards and political power.

The October 1984 CCP Central Committee meeting, which vigorously endorsed the current reforms, also suffered from an undercurrent of opposition from both the leftist (Maoist) and orthodox (Stalinist-Leninist) viewpoints in the military and civilian sectors.[75] Speaking at the 1985 party plenum, Chen Yun led the opposition, stating that more attention should be paid to grain production, central planning, education in communist ideals, and democratic centralism in decision making.[76] The continued opposition of the People's Liberation Army to the reforms may be the biggest threat, although Deng

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73 Oksenberg, pp. 16-17.
Lieberthal, pp. 10-13.

74 Alan P. Liu, "Opinions and Attitudes of Youth in the PRC," Asian Survey XXIV (September 1984): 975-996.

75 Business China XI (10 January 1985).

76 Business China XI (26 September 1985).

Xiaoping is actively pursuing policies to alter its direction.[77]

Some authors see the communist/socialist system itself as inherently unstable. Wojtek Zafanolli has written in detail on China's second economy, including the extent of the black market, illegal real estate transactions, and cheating on production requirements. Interestingly, many of these offenses are being blamed on China's reforms. Although the government is trying to clear up these problems, he sees them as a result of structural factors arising from the very nature of the Chinese political system.[78] Jan Prybyla reflects this view when he writes that the many economic and political policy changes of recent years reflect adjustments and not reforms to the system. He infers that without reform the system is ultimately unworkable. According to him, "the leaders do not want less control over the economy. What they want is more effective and efficient control."[79] As long as the economy's growth allows for widespread improvements in living conditions, these cleavages may be

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[77] Alastair I. Johnston, "Changing Party-Army Relations in China, 1979-1984," Asian Survey XXIV (October 1984): 1012-1039.

[78] Wojtek Zafanolli, "A Brief Outline of China's Second Economy," Asian Survey XXV (July 1985): 715-736.

[79] Jan S. Prybyla, "The Chinese Economy: Adjustment of the System or Systemic Reform," Asian Survey XXV (May 1985): 578.

unimportant. Political unrest could well follow disruptions to the rate of growth.

Not everyone, however, is so pessimistic. Frederich W. Wu, writing in 1981, is more optimistic about the likelihood of leadership stability. "Indeed, the domestic power make-up in China today reflects such an overwhelming preponderance of `pragmatists' that one is inclined to conclude that another cyclical regime change in the future in that country is highly unlikely."[80] He went on to conclude that "politically, the P.R.C. is a moderately low risk country for foreign direct investors".[81]

Domes identifies three potential scenarios for the political environment of the 1990's and beyond. He views them as having equal probabilities. One would be a continuation of the current government's approach. The second would be an evolution towards an even more highly bureaucratized, centralized regime focusing on collective agriculture and heavy industry. The third scenario would be a return to the mass mobilization doctrines of Mao with more emphasis on ideological than economic development.[82] This latter scenario is also posited by Lawrence

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[80] Frederich W. Wu, "The Political Risk of Foreign Direct Investment in Post-Mao-China: A Preliminary Assessment," (July 1981): 20.
[81] Ibid., p. 21.
[82] Domes, p. 240.

Sullivan.[83] It gains some credence from the Chinese government's long history of propounding a philosophical framework to explain its actions. Deng's recognition of the need to be alert to ideological considerations was probably reflected in the campaign against spiritual pollution in the fall of 1983. It was restrained when it got in the way of the Four Modernizations.[84]

Another political factor warranting some attention by firms is that of centralization versus decentralization. There continues to be an unsettled division of authority between central and local governments in handling joint ventures. Initial efforts at decentralization led to some abuses, with resulting calls for increased centralized controls. While some elements of investment and foreign exchange control have been reinforced at the state level, provinces and administrative units retain a high degree of autonomy. The immediate uncertainty this poses foreign investors is whom to negotiate with in establishing a venture. Once a venture is established it would be necessary to stay aware of shifts in this dimension to the degree the shifts are based on issues of resource allocation.

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[83] Lawrence R. Sullivan, "The Role of the Control Organs in the CCP 1977-83," Asian Survey XXIV (June 1984): 597-617.

[84] Bernstein, pp. 33-50.

How should a foreign firm interpret these various political forces at work? Firms certainly cannot expect to exert much direct influence on the political process, as they were once able to do in some developing countries. They also cannot expect to be viewed as apolitical bodies. Real uncertainty surrounds the future political environment in China. Firms that listen to the pronouncements of Chinese leaders who share their views could be caught by surprise. To some degree, firms can protect their assets through the Overseas Private Investment Corporation (OPIC), which began to extend political risk insurance to private U.S. investments in China in 1980. More than that, firms should be very certain of the mutual benefit of their Chinese activities, and not restrict their focus to their own immediate benefits. This implies a thoughtful understanding of Chinese objectives so as to best mesh them with the firm's. This is not a one time evaluation performed before the first contract is signed, but an ongoing assessment as new business opportunities reveal themselves. Further, firms should endeavor to develop and maintain good relationships with their employees, the communities they are in, and all the relevant Chinese bureaucracies. The best corporate citizen may still be hounded from the country in unprofitable disgrace, but

history shows that is less likely than for firms flirting with exploitative practices.

Conclusion

Doing business in China is a complex, time consuming process. There has been enough experience with various forms of foreign investment for a firm to make a reasonable assessment of its probabilities of being successful at establishing an enterprise. Assurance of making an adequate return on a firm's investment is less clear, although this is not exceptional to China.

The foreign exchange provisions of the foreign investment regulations are a source of considerable frustration to foreign firms. In large part, this arises from the firms' objective of having access to the Chinese market. The Chinese, on the other hand, are interested in generating foreign exchange to enhance the country's infrastructure and technology level. These are not necessarily mutually exclusive, but do mean that firms must be attentive to this and have a plan as to how to meet the requirement.

There are few uncertainties associated with the negotiation process that cannot be eliminated by careful planning. The decision making process is slow and

bureaucratic, but not unique to China. The dispute settlement mechanisms are relatively untested so their outcome remains a subject for minor concern.

Ownership and control issues would appear to pose major headaches to a foreign partner, and are an area of genuine uncertainty for foreign investors. Firms must realistically gauge the viability of the project should they be able to in fact effect little control. This would include an assessment of their partner's ability to absorb technology, produce quality product, and achieve product distribution.

China has major infrastructural weaknesses. Plans must be put in place to work around the physical ones, and firms must not rely for profitability on the distorted price system. Access to local markets varies a great deal, but should be resolvable to a major degree through the contract process.

Foreign investment and trade regulations have been implemented somewhat arbitrarily, and firms must anticipate this during negotiations. The changes that have occurred do not seem irrational, however.

Although laws now exist to protect proprietary information, the ambiguity over enforcement poses serious questions for firms with critical proprietary technology. Since China is anxious for high technology, foreign firms

would seem to have significant bargaining power. If the technology were not protected, China would soon find itself without willing suppliers.

On the political front, there are many thorny questions surrounding the ability of the current regime to maintain its policies. There is considerable data to suggest that the current stability may not survive. On the other hand, there is no single powerful opposing doctrine likely to unseat the current regime in the short term. While interesting, a foreign firm can do little other than think through the implications for its business of a change in regime. Not all regime changes would lead to loss of assets. The firm's contribution to the economy and its historical performance could be as important as ideology in ensuring it a future. Of course the limitations on a joint venture's life and the availability of insurance make the threat of nationalization less severe.

This summary suggests that doing business in China involves moderate political and economic risk. The preceding analysis of these risks suggests four general implications for foreign firms.

One is that the Chinese business environment is inflexible. Firms do not have and will not have the capability to take wide ranging actions on any front. The

implication is that firms must very carefully think through their proposals for business activity and not anticipate making sweeping changes after the fact. Any changes will have to be carefully negotiated with their partner (and the government).

A related implication is that firms will not succeed in the long term if they do not manage to mesh their objectives with Chinese ones. The greater the tension between the firms' objectives and those of the Chinese, the more likely the endeavor is to fail.

A third implication is that the complexities of the Chinese business environment are likely to make the overhead costs of entering China and sustaining a business there high. Such costs are likely to be particularly high for the first few firms to attempt to gain entry, largely because of the position of the Chinese on their learning curve. Each succeeding firm faces a more knowledgeable partner. Overhead costs may or may not be a problem for foreign firms depending on the magnitude of their expected project returns, but it should be considered.

A final implication is that the future of the Chinese economic and political system is less certain that that of many countries the firms operate in. China has only recently become open to foreign investment; it is not inconceivable that that could change.

For a firm whose strategic direction meshes with China's development needs, there would appear to be a good opportunity for a mutually satisfactory relationship. Firms whose strategies do not mesh with China's needs would be well advised not to undertake the effort to invest there.

CHAPTER FOUR

THE CHINESE PHARMACEUTICAL INDUSTRY

China has been portrayed as an inflexible place to do business, requiring careful planning prior to entry. This inflexibility dictates that firms mesh their objectives with those of the Chinese. It also means that firms are likely to experience high overhead costs in attempting to enter and sustain business in China. On top of that, the future of the Chinese political and economic system is unusually uncertain, putting at risk the future cash flow a firm might anticipate.

Interpreted in a vacuum, this portrayal of China would discourage most foreign firms from attempting to invest in China. The earlier analysis of the pharmaceutical industry suggested, however, that worldwide product distribution was important for traditional firms to succeed in this industry. They must also seek to lower costs and find new ways to be responsive to national government concerns.

The question addressed in this chapter is the degree to which the Chinese pharmaceutical industry offers foreign firms an opportunity to satisfy the worldwide industry's strategic imperatives and their immediate concern for profit.

The analysis echoes that of the worldwide industry analysis, being based on Hax's and Majluf's approach to environmental scanning. Since very little has been written on the industry, this chapter is also intended to provide information on the industry's structure and size.

The market and sources of supply are briefly described. The current competitive forces in the Chinese pharmaceutical industry as well as those anticipated are touched on. The role of foreign firms in the industry receives particular attention. The specific role of the government in the industry is described. The technological status of the industry is characterized. The implications for foreign firms of this industry analysis closes the chapter.

It quickly becomes apparent that the economic and political forces extant in China play the governing role in this, and in fact all, industries operating in China. The next chapter elaborates on these forces and their impact on the business activities of foreign firms in China.

The Chinese Pharmaceutical Market

China has a long history of pharmaceutical research and production centered on the use of herbal remedies. The traditional remedies have been increasingly supplemented over the last fifty years with Western medicines. Traditional medicine has, if anything, enhanced its position in Chinese medical care since 1949. During the previous century, traditional medicine had been discriminated against. Chinese health policy since 1949 has recognized it as having a valuable role to play, and has incorporated its use in public health work. It has also sought to further develop it by studying it and evaluating it according to modern scientific methods.[1]

Western medicine has become increasingly important. Before 1949, chemical drug production in China was very limited and concentrated in the coastal cities using imported raw materials. After 1949, Western drug production expanded.

The pharmaceutical industry in China today is large, whether traditional or Western medicines are considered. Statistics on the industry are difficult to accumulate and interpret and are frequently inconsistent. Nonetheless, the impression they give is one of a substantial industry.

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[1] Huang Shuze, "The making of a healthier nation," Medical China 1 (Winter 1985): 63.

For example, the traditional sector employs approximately 300,000 in 600 factories. Western medicines are made in 1200 factories employing about 320,000. A further 200,000 are employed in pharmaceutical distribution (see Figure 4.1). Total employment in the industry is thus estimated at 820,000, four times as high as the 206,000 estimated for the drug and pharmaceuticals industry in the U.S. in 1984.[2]

Domestic demand is met mainly by local production. China is reported to produce over 95% of the medicine it uses,[3] and statistics suggest it is a net exporter of medicines. The annual growth rate in tons of output was approximately 4% between 1978 and 1984 (see Figure 4.2). Between 1955 and 1980, state purchases and sales of pharmaceuticals increased by a factor of nine, suggesting a growth rate over this earlier period of about 9%. Herbal medicine sales in 1980 were reported to be only 3 times those of 1957, corresponding to a 5% growth rate. Western medicine grew by a factor of eleven, or an 11% growth rate.[4]

Current output of chemical pharmaceuticals totals 52,000 metric tons annually, corresponding to total pharmaceutical sales of approximately $4.1 billion. This

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2 Predicasts' Basebook 1985, p. 354.
3 Huang, p. 63.
4 SCRIP 701 (14 June 1982): 11.

FIGURE 4.1

CHINESE PHARMACEUTICAL INDUSTRY

	Traditional	Western	Total
Employees (number)			
Factories	300,000.[a]	320,000	620,000
Distribution			200,000
Total			820,000
Factories (number)	600	1200	1800
Output			
Weight (metric tons)	700,000	60,000.[b]	760,000
Types	5,700	11,000	6,700
Formulations	3,000	3,000	6,000
Distribution			
Wholesalers			2,000
Retailers			50,000

SOURCE: SCRIP 998 (13 May 1985): 18.
[a] Elsewhere estimated at 289,000 in 1981 and 324,000 in 1984. SCRIP 1030 (2 September 1985): 22.
[b] Somewhat overstates actual output. 1984 output reported at 52,000 metric tons (see Figure 4.3).

FIGURE 4.2

CHINESE PHARMACEUTICAL PRODUCTION AND SALES

	1978	1979	1980	1981	1982	1983	1984	1985
Production: chemical pharmaceuticals ('000 metric tons)[a]	40.7	41.7	40.1	37.3	42.2	48.0	52.0	
Sales: pharmaceuticals ($ million)[b]						3620	4098	4196
Sales: medicinals and pharmaceutical products ($ million)[c]						3701	3990	
Population (million people)[d]						1025	1036	
Pharmaceutical sales per capita ($ per person)						3.53	3.96	

SOURCES: As noted below.

[a] 1978-1979: China Business Review 9 (March/April 1982): 57; 1980-1984: Chemical and Engineering News 63 (10 June 1985): 66 from SSB of the P.R.C. and Chinese Ministry of Chemical Industry.

[b] SCRIP 987 (3 April 1985): 18. 1985 is forecast.

[c] Same as [b] but includes Chinese medicinal herbs, patent medicines, medical apparatus, chemicals, glassware, and chemical reagents.

[d] Business China XI (14 March 1985): 36.

translates to just under $4 per person per year. Interpretation of these figures is difficult because drug production is reported to be subsidized. Prices of drugs have been lowered at least eight times since 1949.[5] Such cuts averaged 5% in 1984, for example.

The Chinese industry appears to be much stronger on several measures than the pharmaceutical industry in the other large, poor countries of Asia, India and Indonesia (see Figure 4.3). Virtually all domestic consumption is derived from locally produced drugs. The consumption per capita is also about double that in India and Indonesia.

Accompanying its strong domestic production position is a relatively large trade surplus in pharmaceuticals (see Figure 4.4). Exports exceed imports by a factor of about seven. They have multiplied twenty times between 1955 and 1980, suggesting an annual growth rate of 13%.[6] The growth rate since 1980 has been slightly slower, approximately 10%. Pharmaceuticals, however, account for a tiny portion of China's trade -- about 1% of its exports and about 0.2% of its imports. Most exports are to Japan, with U.S. directed exports accounting for only about 10%.

Detailed breakdowns of export data by traditional and Western medicines are unavailable. Traditional medicines

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5 Far Eastern Economic Review, 11 April 1985, p. 60.
6 SCRIP 701 (14 June 1982): 11.

FIGURE 4.3

PHARMACEUTICAL INDUSTRY IN CHINA, INDIA, AND INDONESIA

	China 1983	India 1977	Indonesia 1975
Population (million people)	1025.[a]	653	130
Pharmaceutical production ($ million)	3620.[a]	822	128
Pharmaceutical consumption ($ million)	3426.[b]	980	160
Pharmaceutical consumption per capita ($ per person)	3.30[c]	1.50	1.20
Production as a percentage of consumption	106.[c]	84	80
Market share of foreign firms (%)	1.[c]	70	50

SOURCES: Chart based on Gary Gereffi, The Pharmaceutical Industry and Dependency in the Third World (Princeton: Princeton University Press, 1983), p. 213. Data on India and Indonesia from Gereffi. Data on China as noted:

[a] See Figure 4.3.
[b] Sales-exports+imports (see Figures 4.3 and 4.5).
[c] Computed.

FIGURE 4.4

CHINESE PHARMACEUTICAL TRADE

	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Imports of medicinal and pharmaceutical products[a] ($ million)					19	30	34	43		
Total imports[b] ($ billion cif)	6.6	7.2	11.7	15.7	19.9	21.6	18.9	21.3	26.8	33.4
Exports of medicinal and pharmaceutical products[c] ($ million fob)	40	60	75	115	184	215	223	237	272	
Total exports[c] ($ billion fob)	6.9	7.6	10.0	13.6	18.1	21.6	21.9	22.2	25.0	25.8
Trade balance: medicinal and pharmaceutical products[d] ($ million)					165	185	189	192		

SOURCES: As noted below.

[a] Chemical and Engineering News 63 (10 June 1985): 66, from CIA estimates from trade partners.

[b] 1976-1977: Ho and Huenemann, p. 22, Chinese estimates; 1978-1984: China Business Review 12 (March/April 1985): 54-55, Chinese estimates; 1985: Wall Street Journal, 23 January 1986, p.34, MFERT estimate. The 1985 trade deficit since reported to be $13.7 billion (per Customs Administration) or $14.9 billion (per State Statistical Bureau), double the $7.6 billion shown here. Wall Street Journal, 4 March 1986, p. 34.

[c] 1976-1979: China Business Review 8 (March/April 1981): 15; 1980-1983: Chemical and Engineering News 63 (10 June 1985): 66, from CIA estimates; 1984: Business China XI (27 June 1985): 91, Chinese estimates.

[d] Computed.

presumably account for a large proportion of the total, with most directed to Japan.

Most of China's Western drug exports are in the form of bulk drugs. For example, China is the second largest foreign supplier of caffeine and vitamin B1.[7]

A close look at U.S. pharmaceutical trade data with China reveals the high dependence on basic chemicals (see Figure 4.5). The U.S. imports grew by seven times between 1979 and 1983. U.S. exports to China, much smaller in magnitude than its imports, grew by a factor of four. A detailed breakdown of U.S. pharmaceutical imports from China shows that more than half are vitamins, alkaloids, and caffeine. Antibiotic plants in China first received U.S. Food and Drug Administration approval to ship to the U.S. (handled on a plant by plant basis) in 1981. Since then, antibiotic sales have become increasingly significant Chinese exports to the U.S.

FDA approval for specialty drugs is much more difficult to achieve than it is for bulk drugs. The cost for getting one drug approved approximates the value of total Chinese pharmaceutical exports to the United States, about $20 million.[8] In these circumstances, it is not surprising that most trade activity is in bulk drugs,

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[7] China Business Review 9 (September/October 1982): 32-36.

[8] Far Eastern Economic Review, 11 April 1985, p. 60.

FIGURE 4.5

U.S. TRADE WITH THE P.R.C. IN PHARMACEUTICALS

	1979	1980	1981	1982	1983
U.S. imports of medicinal preparations ($ million customs value)	3.8	9.6	19.8	19.7	25.0
Total U.S. imports from the P.R.C. ($ million customs value)	548.5	1039.2	1830.0	2215.9	2217.5
U.S. exports of medicinal preparations ($ million fas)	0.4	0.4	0.7	1.7	1.5
Total U.S. exports to the P.R.C. ($ million fas)	1716.5	3749.0	3598.6	2904.5	2163.2
Trade balance: medicinal preparations ($ million)	-3.4	-9.2	-19.1	-18.0	-23.5
Composition of U.S. imports (% of total)					
Vitamins		25	45		
Alkaloids and compounds		27	8		
Caffeine		6	10		
Other		42	37		

SOURCES: Import/export data from China Business Review 11 (March/April 1984): 19. Composition of imports from China Business Review 9 (September/October 1982): 35.

of which 57 were listed with the FDA as of the middle of 1984.[9]

The major supplier, and therefore competitor, in the Chinese pharmaceutical industry is the State Pharmaceutical Administration (SPA), a governmental body. Other competitors in the industry, such as the provincial level factories and foreign firms, maneuver within a complex administrative structure encompassing and to some degree controlled by the SPA. Therefore, the concept of independent competitors breaks down. The relationship between competitors is perhaps better described as a dominant firm oligopoly, with the individual smaller players exercising very little control once having decided to enter the market. This, however, is anticipating the conclusion, and calls for further demonstration and clarification here.

Pharmaceutical regulation, production and distribution is under the State Pharmaceutical Administration and several state business corporations (see Figure 4.6).[10] The SPA reports directly to the State Council, as does the Ministry of Public Health. The Ministry has traditionally been concerned with such health issues as the therapeutic value of drugs and not with the economic aspects of their production. In the middle of

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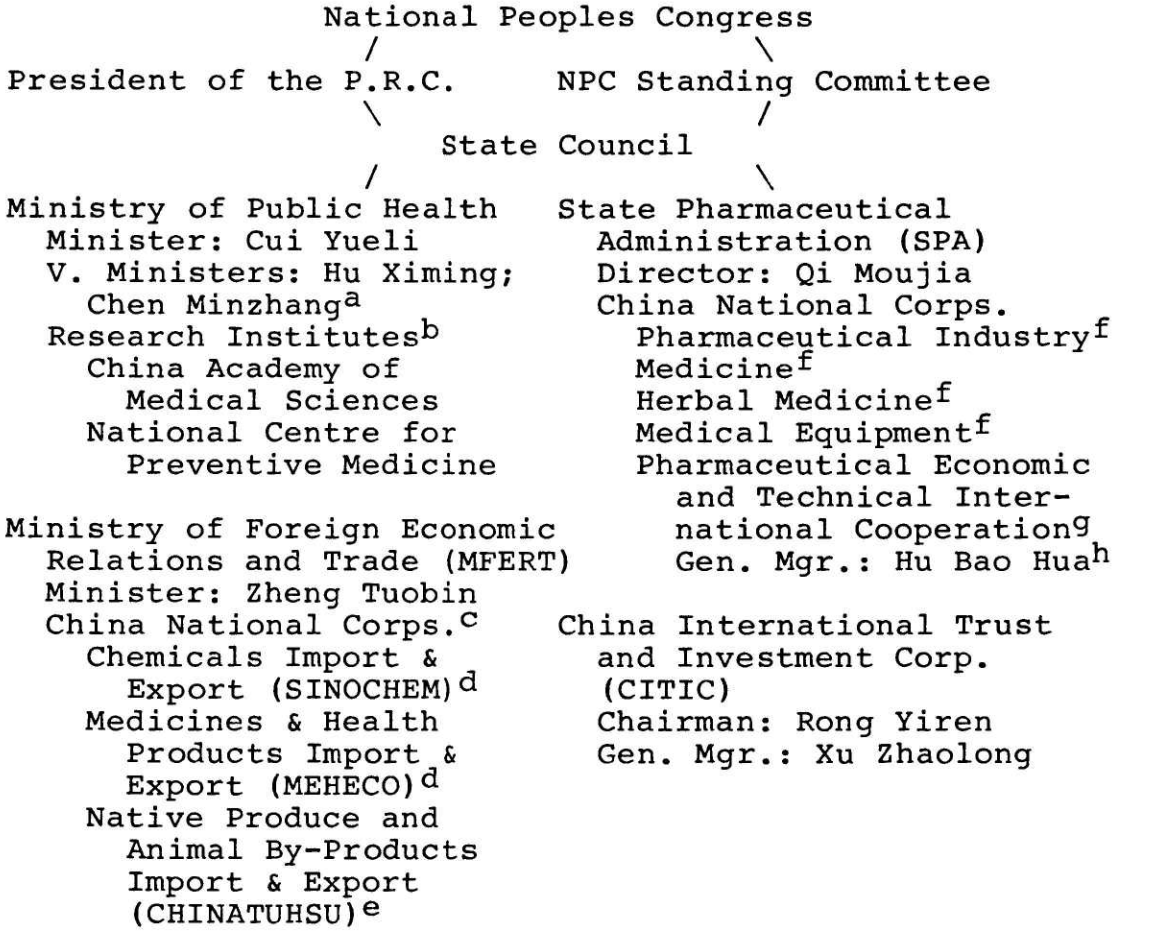
9 The Food and Drug Letter, p. 7.

10 SCRIP 998 (13 May 1985): 18.

FIGURE 4.6

CHINESE PHARMACEUTICAL ADMINISTRATIVE STRUCTURE



SOURCES: Overall structure from Domes, p. 96. Ministry and other organizational detail from Business China XI (26 September 1985): 140-141, except as noted.

[a] Medical China 1 (Winter 1985): 60.

[b] Shuze, p. 64.

[c] MFERT sponsored these corporations until 1 January 1985.

[d] China Business Review 10 (May/June 1984): 42-43.

[e] Chris Brown, "Pharmaceuticals," China Business Review 9 (September/October 1982): 32-36.

[f] SCRIP 998 (13 May 1985): 18.

[g] Listed as a partner by Johnson & Johnson and Warner-Lambert. Not separately identified by SCRIP in its May 1985 organization rundown, so may be part of China National Corporation of Pharmaceutical Industry.

[h] Warner-Lambert World 15 (July/August 1985): 1.

1985, however, the Ministry was charged with overseeing drug production and supply.[11] These new responsibilities would appear to blur the traditional distinctions between the two organizations.

The SPA is responsible for the administration of production and domestic distribution of pharmaceutical and medical products. It also sponsors R&D, trains personnel, constructs plants, and engages in cooperative ventures outside China. It is responsible for 2100 industrial enterprises and farms for raising plants and animals (mainly as sources for traditional medicine), 2000 wholesaling units, 50,000 retailing units, 35 research institutes, and 14 academic institutes.

The activities of the SPA are administered by several national business corporations. The first is the China National Corporation of Pharmaceutical Industry. It is responsible for drug production. It has 1200 enterprises, employs 320,000 people, produces 60,000 tons of bulk pharmaceuticals of 1000 different types, and formulates these in 3000 ways.

The China National Corporation of Medicine is responsible for distribution and marketing of pharmaceuticals, medical equipment, and other medical

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[11] SCRIP 1014 (8 July 1985): 17.

supplies. It manages 2000 wholesaling divisions and 50,000 retail outlets with a total of 200,000 employees.

The customer for drugs in China is the ultimate consumer of the drug in some cases and doctors and administrators of clinics and hospitals in other. In this sense, the customer is more heterogeneous than in most developed countries.

The China National Corporation of Herbal Medicine is responsible for the production and distribution of medicinal plants. It supports 600 traditional pharmaceutical facilities and farms staffed by 300,000 employees. It grows 700,000 tons of 5700 types of plant, converting this material into 3000 dosage forms. Outside the aegis of the China National Corporation of Herbal Medicine come many specialized herbal medicine companies.

The China National Corporation of Medical Equipment is considerably smaller than the other companies and is responsible for manufacturing medical equipment and supplies. It supports 300 enterprises with 80,000 employees.

A fifth corporation associated with the SPA and having responsibility for its relations with foreign investors is the China National Corporation for Pharmaceutical Technical and Economic International

Cooperation. It has been a partner in several ventures with foreign firms.

Imports and exports of drugs are handled by corporations affiliated with the Ministry of Foreign Economic Relations and Trade (MFERT). One is the China National Corporation for Chemicals Import and Export (SINOCHEM). Imports are handled by the China National Corporation for Medicines and Health Products Imports and Exports (MEHECO).[12] A third organization, the China National Corporation for Native Produce and Animal By-Products Import and Export (CHINATUHSU), markets traditional Chinese medicine abroad.[13]

Below the level of the State Pharmaceutical Administration are the regional level factories, presumably included in the total counts of SPA enterprises. While reporting to provincial or municipal level authorities, they retain strong ties to the SPA. Examples include the Shanghai Pharmaceutical Industrial Corporation.

Since 1979, the Chinese have been much more open to foreign pharmaceutical firms' influence, and foreign firms are beginning to compete in this industry. The most direct competition is provided by those firms that have

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12 Far Eastern Economic Review, 11 April 1985, p. 60.
13 Chris Brown, "Pharmaceuticals," China Business Review 9 (September/October 1982): 32-36.

established manufacturing joint ventures. All published manufacturing joint ventures are enumerated in Figure 4.7 (with details in Appendix A). Eleven have been identified, of which seven are driven by U.S. companies, two by Japanese, and one each from Sweden and the Netherlands. Canadian and Belgian firms are also involved as partners. Two of the U.S. companies with joint ventures -- Squibb and Parke-Davis (now a division of Warner-Lambert) -- apparently had facilities in China prior to 1949, as did Eli Lilly.

The total investments range in size from approximately $1 million to $30 million. These investments represent a tiny fraction (<1%) of total money pledged by all partners to joint ventures in the P.R.C. (see Figure 4.8).

In those cases for which details have been published, with one exception, the foreign firm has an equity holding of at least 50%.

The output of the joint ventures ranges from antibiotics to patented drugs to packaging materials to traditional medicines to biological products. Data is not available on the detailed output of each joint venture. It is difficult therefore to assess the degree of overlap in the products and the likelihood of competition between foreign firms. A review of those details available

FIGURE 4.7

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

Foreign Firm	Country	Date	Foreign Equity Share (%)	Total Inv. ($mill)
Johnson & Johnson	U.S./Belgium	1985	>50	30
Astra, Kabi-Vitrium, Ferring, Ferrosan, Leo	Sweden	1982	50	24
Warner-Lambert	U.S.	1985	50	14
SmithKline Beckman	U.S.	1984	55	10
Squibb	U.S.	1982	50	8
Otsuka	Japan	1980	50	6.6
Promega/Sinogenetik	U.S./Canada	1985	40	1
AICC	U.S.	1985	N/A	N/A
Biogen	Netherlands	1983	N/A	N/A
Chinese-Japanese Tonic Medicines	Japan/P.R.C.	1985	N/A	N/A
ImmunoGenetics/KaiTai	U.S./H.K.	1985	N/A	N/A
TOTAL INVESTMENT				>94

SOURCE: See Appendix A.

FIGURE 4.8

PHARMACEUTICAL JOINT VENTURES VERSUS ALL MANUFACTURING JOINT VENTURES IN CHINA

Total investment in pharmaceutical joint ventures as of January 1986	>$94 million
Estimated foreign share of pharmaceutical joint ventures	>$47 million
Total pledged by all countries to joint ventures (1979-June 1985)	$10,900 million
Total invested by all countries in joint ventures (1979-June 1985)	$3,700 million
Number of projects approved	4,773
Hong Kong/Macau	58% of total
Japan	13%
U.S.	12%
Australia	1%
Other	6%

SOURCE: Pharmaceutical investments from Figure 4.7. Total joint venture investments from China Business Review 12 (November/December 1985): 33.

suggests there is some overlap in therapeutic categories (alimentary tract; anti-infectives) but limited specific product overlap.

Applying a Porterian analysis to the competitive patterns of the Chinese pharmaceutical industry is complicated by the overwhelming role of the government in shaping the environment. The five forces identified by Porter -- rivalry among competitors, barriers to entry and exit, the power of buyers and suppliers, and availability of substitutes -- will be summarized in the Chinese context.

Foreign firm experience in the Chinese market is still very limited, and it is difficult to assess the degree to which rivalry between firms will shape the attractiveness of the market. The high level of government control over the extent of rivalry can prove to be either highly favorable or unfavorable to firms depending on the way the control is exercised. The existence of government agencies as direct competitors and collaborators suggests a relatively narrow band of competitive options will be available to firms. To date the primary competitors of foreign firms in China are the Chinese firms with comparable, although less sophisticated, products. As the number of firms proliferates, and product sets overlap, the basis of

competition could shift to being between foreign firms, with the Chinese firms defining the context for operating. Demand for pharmaceuticals is likely to grow so it is feasible to anticipate a scenario where foreign firms focus on unique market niches with Chinese firms providing standard generic drug products. In this event, rivalry would probably be low. A more likely scenario is that firms' objectives to reach a broad market accompanied by Chinese incentives of providing low cost drugs to its population will encourage intense rivalry with time. The high level of interest in forming joint ventures identified during the interviews substantiates this forecast.

Barriers to entry are controlled very strictly by the Chinese government and are high. The barriers are not due to features characteristic of this particular industry or the firms within it. Rather, they arise from Chinese government priorities for the industry. The specifics of those priorities will be covered later in this chapter. As with any set of barriers, ways can be found to bypass them. A close synchronization of Chinese objectives with firm capabilities and goals can result in fairly straightforward access. In other cases, access is much more difficult, as will be revealed in the interview results.

It is premature to assess the barriers to exit from the industry since it has only recently opened up. A complicating factor is that all the foreign firms are joint venture partners with Chinese firms. Exit from the market would entail dismembering a contractual relationship, probably incurring both psychological and economic losses. An obvious barrier for foreign firms would be the potential loss of assets, which are likely to be much more difficult to liquidate than those in their home country. Exit outside the terms of the joint venture agreement would seem to be difficult.

Turning to the power of buyers, the Chinese market presents a unique situation. There is currently one significant buyer, the China National Corporation of Medicine, which manages both wholesale and retail operations. There are a few, much less significant, export buyers. The buyer exerts extraordinary control, since it is administered by the same government agency that administers production activities of all firms.

The suppliers to the firms in the industry -- both Chinese and foreign -- are primarily Chinese. In some cases, active ingredients are imported to China by the foreign partner. With supply so concentrated, firms are in a weak bargaining position. Foreign firms' major

suppliers are the Chinese firms who are also their direct competitors.

The Chinese pharmaceutical industry is widely believed to have an equivalent drug to most drugs available in the West. Production capacity may be severely constrained, costs may be high, or the drug may be less refined, but there is almost always a substitute.

A summary of these competitive forces in the Chinese pharmaceutical industry paints a very negative picture (see Figure 4.9). The most favorable aspect for firms operating in China is that barriers to entry are fairly high. The reasons for this are outside the control of the foreign firms, however, so provide little sustainable source of advantage for those who do succeed in entering. Barriers to exit are likely to be high because of the nature of joint equity agreements. Rivalry among competitors, while currently insignificant, has the potential to be fierce. With a single buyer, and only a few more suppliers, their power becomes significant. Since the buyer and supplier are also the dominant competitors, they can effectively control the behavior of the foreign firms. Likewise, there are generally substitutes available for a foreign firm's products.

FIGURE 4.9

SUMMARY OF COMPETITIVE FORCES IN THE CHINESE PHARMACEUTICAL INDUSTRY

	Industry Attractiveness					
	1986			Future		
	Unfav	Med	Fav	Unfav	Med	Fav
Barriers to entry		X			X	
Barriers to exit		X		X		
Rivalry among competitors		X		X		
Power of buyers	X			X		
Power of suppliers	X			X		
Availability of substitutes		X		X		
OVERALL		X		X		

The Role of the Chinese Government in the Pharmaceutical Industry

The Chinese government plays multiple roles in its pharmaceutical industry. It is a competitor, buyer, and supplier, as discussed in the previous section. It also plays a role common to governments elsewhere in regulating drug industry activities.

Regulations surrounding the development, manufacturing, and distribution of pharmaceuticals within China have been slow to evolve. Since 1949 the State Council has periodically issued regulations concerning pharmaceutical management, control of narcotics, and the improvement of pharmaceutical practices. The Ministry of Public Health provided more detailed guidance on standardization, the management of new pharmaceuticals, and institute research procedures.

In the late 1970's, the Pharmacopoeia Commission was reestablished following a prolonged shutdown during the Cultural Revolution. It consists of more than one hundred pharmacologists assisting the Ministry of Public Health in drug standardization. In 1980, the Ministry published the Pharmacopoeia of the P.R.C. with standards for medical

isotopes, imported crude drugs, and traditional remedies.[14]

In 1981, the State Council adopted a decision stipulating that all medicines and medical equipment must meet state approved standards.[15] On July 1, 1985, legislation was enacted to control the manufacture, marketing, and import and export of pharmaceutical preparations.[16] This "Law of the People's Republic of China on the Control of Medicines" was approved in 1984 by the Standing Committee of the Sixth National People's Congress. Details have been laid out in the "Regulations on the Control of Medicines," "Regulations on the Control of New Medicines," and the "Regulations on the Control of Anaesthetics."[17] An evaluation committee of 51 experts was set up to enforce the new laws. This committee will also evaluate new drugs and eventually those already on the market for compliance with the legislation. This is the legislation that empowered the Ministry of Public Health to oversee drug production and supply.

Chinese patent law enacted in March 1984 excludes medicines from patent protection. There is protection for processes, although this is regarded as being of little value.

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14 SCRIP 701 (14 June 1985): 11.
15 SCRIP 650 (9 December 1981): 9.
16 SCRIP 1014 (8 July 1985): 17.
17 Huang, p. 61.

Another way the government impacts the industry is through its active involvement in establishing economic goals and implementing programs to achieve them. The industry is not one of China's highest priorities. Higher priority goes to industries seen as being the basis for sustained economic growth. These include those providing basic industrial infrastructure -- ex. energy development -- and those at the leading edge of global economic growth -- ex. electronics. Pharmaceuticals are consumer oriented and thus do not directly fuel long term economic growth. The sixth five year plan specified that China was to spend 5% of its GNP on health care by the year 2000. As an investment priority, however, the entire category of chemicals (of which pharmaceuticals is a minuscule part) was limited to 5% of the sixth five year plan's investment levels.

In early 1985, Qi Moujia (the director of the State Pharmaceutical Administration) urged the pharmaceutical industry to concentrate on four key areas:

1. upgrade technology;
2. improve quality control;
3. increase the number of products;
4. increase profitability.[18]

Technological Forces

Acquisition of technology is a major impetus behind the Chinese government's interest in expanding the role of foreigners in the industry. A number of those I interviewed commented favorably on the sophistication of the Chinese drug industry. I was told that the Chinese have a "me too" version of virtually all drugs available in the developed countries. Production techniques were generally regarded as manual and out of date, with many on too small a scale to achieve standard efficiencies, however. The Chinese appear to have particular strengths in fermentation technology for antibiotics, contraceptives, and treatments for alimentary tract and metabolic disorders. Their research interests, based on reports of findings, range broadly, however.

In order to accelerate the pace of technological change, the Chinese have engaged in a number of activities. One, as described in the section on

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[18] SCRIP 987 (3 April 1985): 18.

competitive forces, is the formation of manufacturing joint ventures, most of which involve technology transfer. A second is a variety of cooperation agreements, including compensation trade, licensing, and technology transfer. A third activity the Chinese have participated with foreign firms in is joint research and development. Along with these activities, the Chinese have purchased equipment and production know-how to upgrade existing facilities. Each of these activities will be described here briefly, with all published details of each venture to be found in Appendices B through D.[19]

A variety of arrangements between the P.R.C. and foreign firms are identified in Figure 4.10, and details are available in Appendix B. Three of the arrangements are with U.S. firms, two of which went on to form manufacturing joint ventures. Japanese firms account for three more, French firms for two, and an Italian firm for one. These also cover a wide variety of products. These agreements usually require the foreign firm to provide technology (through a license for example) and training

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[19] The agreements have been categorized as accurately as possible. The totals are inconsistent with those reported by Qi Moujia in early 1985. At that time, he stated that eight technical cooperation agreements and four joint ventures had been established with foreign firms in Belgium, France, Japan, Switzerland, Sweden, and the U.S. (SCRIP 987 (3 April 1985): 18) I currently count eleven joint ventures and only seven cooperation agreements (excluding research and development projects).

FIGURE 4.10

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

Foreign Firm	Country	Date	Activity	Product
Eisai	Japan	1979	N/A	Biologicals animal products)
Johnson & Johnson	U.S.	1983	Compensation trade agreement	Antiwormer
Lark	Italy	1983	Technology transfer	Vaccine strains
Pfizer	U.S.	1984	License	
Promega Biotec	U.S.	1983	Cooperation	Enzymes and reagents
Rhone Poulenc	France	1984	Cooperation	N/A
Sanofi	France	1983	Technology transfer	Hepatitis B vaccine
Tanabe Seiyaku	Japan	1985	License	Infusion solutions
Teikoku Seiyaku	Japan	1985	N/A	Poultice medicines

SOURCE: See Appendix B.

(in both China and the home country). Although details are only occasionally available, the foreign firm frequently receives output of the venture in payment.

Thirteen research and development agreements have been identified between foreign and P.R.C. enterprises (see Figure 4.11). Only two of these are with U.S. firms, and they both involve anti-cancer research. Six are with Japanese firms, four of which are pursuing the development of drugs from traditional medicine. French, German, Swedish, and Brazilian firms have also entered R&D agreements with the Chinese. In general these agreements appear to require that the Chinese provide the physical laboratory facility, some scientists, and the necessary technicians. The foreign firm provides technology in the form of specialized equipment and training for the Chinese scientists in both the home country and China. Most of the agreements (seven) are to produce drugs from traditional medicines. These ventures are intended to determine the active ingredients of traditional medicines, as well as their safety and efficacy. These ventures presumably hope to turn up new treatments applicable in Western medicine and not simply aid in improving the consistency of existing ones. Most of the remaining research and development projects fall into the general category of biotechnology as broadly defined. Few details

FIGURE 4.11

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

Foreign Firm	Country	Date	R&D Scope
Biotech Research	U.S.	1983	Monoclonal antibodies for cancer
N/A	Brazil	1983	Drugs from traditional medicines
N/A	France	1984	Biotechnology
Hoechst	W. Ger.	1985	Cardiovascular agents
Newport Pharm. Intl; U. of Texas System Cancer Center	U.S.	1983	Cancer drugs from traditional medicines
Nippon Zeon	Japan	1985	Biotechnology
Nippon-Zoki	Japan	1982	Hematology and immunology
Otsuka	Japan	1982	Drugs from traditional medicine
Pharmacia	Sweden	1985	N/A
N/A	Sweden	1984	Drugs from traditional medicine
Taisho	Japan	1984	Drugs from traditional medicine
Tsumura Juntendo	Japan	1981	Drugs from traditional medicine
Yamanouchi	Japan	1985	Drugs from traditional medicine

SOURCE: See Appendix C.

are available to give clues to the intent of the research. The means by which the foreign firm is compensated have also not been outlined in the press reports.

At least ten firms have supplied significant quantities of equipment or designed production facilities for Chinese enterprises (see Figure 4.12). Two agreements involved sales to P.R.C.-foreign joint ventures. In contrast to the pharmaceutical manufacturing and R&D activities, British firms are fairly active, accounting for a third of the sales. Other countries include Canada, Belgium, the U.S., Japan, and West Germany with one each.

The only data provided by China on investment in this industry by foreign firms came in early 1985. The director of the State Pharmaceutical Administration said that the Chinese had spent $50 million in foreign exchange since 1979 to import advanced pharmaceutical equipment and technology.[20] This would appear consistent with the levels of activity identified above.

The Chinese appear to be focusing primarily on high technology products and processes in their dealings with foreign firms. A consolidation of all requests by pharmaceutical firms in China for foreign investors was published in the China Business Review in late 1984. Of the 46 individual requests, 13 were for biochemical

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[20] SCRIP 987 (3 April 1985): 18.

FIGURE 4.12

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

Foreign Firm	Country	Date	Project Scope
Autopack	U.K.	1983	Vial filling equipment
Capsule Technology	Canada	1984/1985	Capsule manufacturing plants
Coppee-Courtay	Belgium	N/A	Plant design for Janssen joint venture
Hitachi	Japan	1983	Drug analysis equipment
M.W. Kellogg	U.S.	1985	Pharmaceutical plants
C. E. King	U.K.	N/A	Tablet packaging equipment for Squibb and Swedish joint ventures
Pharmaceuticals Production Consultancy	U.K.	1983	Upgrade pharmaceutical plants
Suzuken	Japan	1984	Workshop design; ampoule production equipment
Westfalia	W. Ger.	1983	Antibiotic manufacturing equipment
N/A	N/A	1983	Capsule manufacturing equipment

SOURCE: See Appendix D.

products, 10 for product packaging materials, 7 for antibiotics, 7 for production equipment (mainly packaging), 5 for vitamins, 2 for traditional medicine, and 2 for bandages.[21] This list supports the Chinese thrust towards upgrading production facilities and improving technology.

It also highlights an interest in biotechnology, although industry observers report widely differing views of Chinese capabilities. Jeffrey L. Lee, a Commerce Department regional economist, thinks that China excels in biotechnology[22], although I was frequently told it was China's greatest weakness in pharmaceutical technology during my interviews.

Strategic Implications

The most attractive features of the Chinese pharmaceutical industry are its large size, its relative sophistication, and its long term capacity for growth. Although any projections of the future are highly speculative at this stage, the Chinese pharmaceutical industry has, in my opinion, the capability of becoming a major player in the world industry over the next twenty

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[21] China Business Review 11 (November/December 1984): 48.

[22] Chemical Week 134 (11 January 1984): 16.

years. Its highly developed base of traditional medicines and its current levels of sophistication in Western medicine speak well for its interest in the industry and its ability to innovate and grow.

The efforts of the Chinese to upgrade the technology of the industry, as well as to enhance their export base, provide immediate business opportunities for foreign firms.

Many other features of the industry are much less attractive as a result of the role of the Chinese government. Firms have little bargaining power other than their technology. Once engaged in a technology transfer agreement, they potentially lose that. The implication for foreign firms is that they must either provide significant export potential the Chinese themselves could not create or they must be in a position to continually strengthen the Chinese technological capability. One way to achieve this could be through a venture combining research and development and production. The R&D could initially be focused, for example, on developing specialized products for the specific disease patterns prevalent in China and other relatively poor countries.

Firms anxious to participate in the Chinese market in the way they compete in Europe, Japan, or the U.S. are likely to be frustrated by their nearly complete inability

to control their environment as well as their own venture's actions.

CHAPTER FIVE

PHARMACEUTICAL INDUSTRY INTERVIEW RESULTS

Interviews were conducted to understand both the reasons behind firms' activities in China as well as the nature of their business experiences there. One objective of the interviews was to assess the strategic framework within which firms make their decisions regarding business activities in China. Another objective was to determine the degree to which the economic and political environment of China shapes their decision to invest and the nature of any investment.

The Fortune 500 list for 1984 included 19 U.S. companies identified as pharmaceutical firms. Seventeen of the nineteen were contacted. Of the two not contacted, one was in the midst of a chapter 11 bankruptcy reorganization and the second is a wholly owned subsidiary of a German firm. Of the seventeen contacted, ten agreed to interviews. One was conducted over the telephone; the remainder were held in person. Of the seven not

interviewed, two firms denied having any activity in China. In the case of two other firms, Chinese activities were managed in Asia or in Australia, and there was no one in the U.S. company knowledgeable enough to discuss them. The firms interviewed are the most active of the nineteen in China based on published information.

The individual interviewed at most of the firms was the senior executive responsible for Chinese and in some cases Asian or international business. In a few cases, the individual interviewed held a senior staff position with direct responsibility for developing business in China. In all cases, the individuals appeared to be highly knowledgeable of their firm's business activities in China. In most cases they were also very knowledgeable of their competitors' activities. Some of this knowledge came from careful perusal of the trade press. These individuals also meet occasionally at professional society meetings designed to encourage U.S.-China relations and in other non-official forums.

The interviews were deliberately unstructured to allow for a free flowing discussion on both strategic and tactical issues. They generally followed a format designed to elicit a description of the firm's activities in China as well as its motivations for being there. Discussion then shifted to a description of doing business

in China, with the underlying intent of understanding which characteristics were most troublesome in firms' minds.

Firms' Activities In China

All the firms interviewed are conducting business in China, although to widely varying degrees.

Companies A, B, C, and D are among the pharmaceutical firms that have signed joint venture agreements with Chinese enterprises. These joint ventures all call for production. Three of the firms are planning to import pharmaceutical raw materials for conversion to packaged medicines. One is planning to produce a pharmaceutical material (hard gelatin capsules) for use by other firms in packaging their drugs. The companies are all involved in providing equipment, technology transfer, and training. They are also involved to some degree in qualifying sources within China to serve as suppliers to their joint ventures.

Ownership is split roughly equally between these firms and the Chinese enterprise. One firm is U.S. controlled with a 55% share, one with a 52% share, and two with 50%. In all four cases, the firms have discussed further investment plans with the Chinese should the

initial activity succeed. The firms' future plans frequently involve extending their production vertically into pharmaceutical raw materials.

Formation of the joint venture was generally preceded by trade, and in one case by a compensation trade agreement. These companies are typical of those in their industry in the degree of their diversification. Three of the four are involved with the Chinese in cooperative agreements related to other, non-pharmaceutical products.

Production in all four cases is geared towards the domestic market. The foreign partner is responsible for whatever export distribution occurs. The Chinese partner is assumed to be responsible for the product's internal distribution. Exports are necessitated by a requirement that the projects be self-sufficient in terms of foreign exchange. Exports must provide adequate foreign exchange to pay for imports (including follow on capital goods), to repatriate profits, and to repay any foreign exchange denominated loans.

Companies E, F, and G are in the midst of negotiations with the Chinese to form joint ventures of the type already consummated by companies A, B, C, and D. Company E has approached doing business with the Chinese in a gradual manner -- moving from trade to a licensing agreement to its current joint venture negotiations.

Given the strength of its existing relationships, it is likely to conclude an agreement this year, in my opinion.

Company F has also attempted to approach the Chinese market in a phased in way, shifting from trade to a willingness to license to current negotiations over a joint venture. It has had a difficult time identifying good fields of opportunity with the appropriate Chinese authorities. Its apparent eagerness to come to an agreement suggests to me however that it is likely to form a manufacturing joint venture in 1986.

Company G, on the other hand, is approaching China very cautiously, both in the products it is offering and the terms it is willing to negotiate. Given the willingness of other firms to incorporate updated products and technology into their agreements, it seems unlikely that company G will succeed in signing a joint venture in the near future.

Company H has so far limited its activities in China to an active sales force. Companies I and J are at even earlier stages, merely exploring potential avenues to increase sales to the P.R.C.

Motivation for Firms' Activities

The firms reported similar reasons for being in China. In most cases firms supplied more than one reason. Only one firm, company A, stated a specific goal in regard to its China business. It wants to be the largest health care provider (of both products and services) in China, and has structured its efforts accordingly. Other firms expressed their objectives much more vaguely -- i.e. "to have a presence", "to reach the large market", "to get a toehold", etc.

The most frequently mentioned reason for being in China is the size of China's population, which currently exceeds one billion people. If Japanese per capita pharmaceutical consumption of $113 in 1980 were to apply to China's one billion people, the market for drugs in China would be $113 billion, nine times the size of the U.S. market in 1980.[1] In an industry facing increasing global competition and a shift in its technology base, the magnitude of this potential provides considerable breathing space.

All of the firms realize that it is a long road from a potential market of one billion people to a realized one. Company H, a firm currently only trading with China,

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[1] Burstall and Michon-Savarit, p. 48.

initially sees its market as being the city hospitals for the elite and not the entire population. Its executive argued that the current level of the Chinese pharmaceutical industry is adequate to meet the population's needs, and that the premiums the U.S. firms offer (unique and advanced products) are likely to be available only to the elites.

Several companies said they are active in China as extensions of their activities throughout the developing world. The logic underlying this is that some firms believe profits in the industry are a function of the premium patented or trademarked products can earn for a while. It is critical to distribute such products as broadly as possible to enjoy the monopoly profits as long as possible. Once China opened up, it became important to be active there. Companies A, B, D, and E specifically cited their presence elsewhere in Asia as a background and driving force for their involvement in China. All four have extensive businesses in both India and Indonesia, two other countries with enormous populations.

The company's experience in Japan frequently contributes to its decision on what action to take in China. In 1980, the Japanese consumption of drugs was the largest in the world in total and on a per capita

basis.[2] Its production was the second largest after the United States. Several of the firms appear to think of China as a country likely to develop to a position of economic strength comparable to Japan's. Company F for example developed a business in Japan shortly after the war, although generally speaking it has a practice of limiting its production activities outside the developed world. Its early efforts in Japan have reaped significant rewards since, and company F hopes the same will happen in China. Company C on the other hand, did not take an active role in Japan in the 1950's and has since regretted it. It does not intend to make the same mistake again, accounting in large part for its decision to form a joint venture in China. Interestingly, both companies C and F have limited or no presence in India and Indonesia. Company H again expressed an alternative view on this issue. It described itself as being late in Japan but does not see Japan and China as being comparable.

Another rationale, expressed by some firms, and dismissed by others, is that there is a "window of opportunity" in China. If a firm fails to get established during this window, it will be very difficult to be an active force in the market later. Companies therefore are

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[2] Ibid.

seeking to gain a toehold today, even when other factors would argue against such an investment.

Firms that believe there is a window and that it is likely to close base their opinion on experiences they have had elsewhere. Company E, with a history of being very active in developing countries, stated that it has had bad experiences when it has not been first, or very early, into a new market. Company F feels that success with the Chinese hinges on developing strong interpersonal relationships, just as it does in Japan. Companies that fail to develop the right relationships as soon as it is possible will face major obstacles when trying to break in later.

Other firms disagreed that there was a window of opportunity with the potential to abruptly slam shut. Company B, one of those with a joint venture, feels there is no window. Nor do companies G and H.

A further rationale was captured neatly by an executive in one firm. In response to my asking why his firm was in China, he laughed and said "you mean aside from the emotional reasons?!" The personal interest of a key senior executive in the Far East and China has clearly been a driving force in several of these companies' endeavors. It appears to have been an important factor for companies B, C, D, and G. It was apparent in many of

the interviews that those I talked to have a very special interest in China that transcended the responsibilities of their office. This was particularly obvious in contrast to comments made about doing business elsewhere in South and East Asia.

Associated with this personal interest in China was the universally expressed view that the Chinese are good businessmen. This is a widely accepted stereotype in the U.S. Most of the executives I met with had also observed it directly in other areas they do business, including Hong Kong and Singapore. Most attribute the lack of similar entrepreneurial behavior in the P.R.C. today to the lack of an appropriate incentive system (i.e. free enterprise system). Their faith in Chinese business skills provides significant psychological comfort in the face of less attractive aspects of investment there.

A factor mentioned only once that is, I believe, nonetheless quite important is that of competitive response. Company E mentioned that when its chairman saw the first joint venture announcement (the one involving Squibb), he expressed considerable concern and interest in what his own firm's level of activity was. Pressure was applied to speed up the process, largely, I believe, to make sure that Company E was not left out of a good business opportunity.

Company F suggested a novel reason for being in China, one that clearly intrigued executives to whom I subsequently mentioned it. Company F's spokesperson said they were very impressed with the current level of technology and product in China given its starting point and limited exposure to foreign innovation until recently. He argued that his firm feels the Chinese could become major leaders in the industry through innovation. They want to be active in China partly to ensure they benefit from the results of such innovations. Company F sees potential to form joint research activities as a base for having access to research results. To date, however, U.S. firms have been slow to recognize this potential, unlike the Japanese and Europeans (see Figure 4.11).

Two firms mentioned profit as a rationale, and then in an inverted way. Companies H and J said that they are unwilling to become involved without short term profit potential, and they see no scope for profits in a manufacturing joint venture in China. They feel the companies there are taking a big risk. Several firms claimed their activities in China are currently unprofitable, with only marginal profits expected in the future. It is certainly widely believed within the industry that no one will make much money, at least not for the next several years. Firms offset this apparent

irrationality with their conviction that as the market expands through their efforts they will be able to generate attractive returns. Companies A, B, C, D, E, and F all anticipate their joint venture activities will provide very low profits well into the future, although none described them as loss leaders.

It is difficult to assess whether the ventures are as unprofitable as described. It is obviously not in the firms' interest to characterize agreements as being highly profitable for at least two reasons. One is that such proclamations could attract the attention of competitors. Secondly, they could damage the firm's relationship with its Chinese partners, who are very sensitive to suggestions of being exploited. The firms involved in trade did report that those activities are profitable, which suggests their comments on the low profits of joint ventures may be true. Executives in describing other firms' activities frequently expressed the opinion that those ventures would be unprofitable.

The size of the firms' current or planned investments provides a few clues to this issue of profitability. The joint ventures in place range from a capitalization of $5 million to $30 million, with the foreign partner generally providing half. The ones planned appear to be in the $10 to $20 million range. Given the cost to develop a single

new drug (approximately $100 million), these are not significant investments. The limited range of the investments also suggests the firms are placing restraints, although several firms, including companies A and G feel the Chinese are restraining the amount of investment through their bureaucratic decision making process. Both companies acknowledged that some of their self-imposed conditions on terms of agreement constrain Chinese options significantly.

Overall then, it appears that firms are anticipating profits. It is unlikely that firms would be pursuing extensions to their current joint ventures for example, unless there were good indications the activities would be profitable.

It is also important to point out those items that were not mentioned as reasons for being in China. No firm plans to be there because they see China as a low cost producer. This is not necessarily a reflection of the industry as a whole. ImmunoGenetics claimed that Shenzhen's low labor cost would give its products manufactured there a significant cost advantage throughout Asia. Several commented that the worldwide production capacity for drugs exceeds demand and that production costs are not a source of competitive advantage in the industry. Furthermore, several of them feel the Chinese

are unlikely to offer a significant cost advantage in any event because of the way labor is compensated in joint ventures.

Given these conditions, the firms were also uninterested in using China as a base for regional exports. As will be further described, the need to balance foreign exchange requirements has driven several firms to agree to export from the joint ventures although they would have preferred not to.

To what extent is this set of motivations consistent with the objectives of the Chinese? The overall investment priorities of the Chinese have been discussed earlier. Their interest in acquiring the latest technology from the West to provide fuel for their growth is reflected in their dealings with pharmaceutical firms. The relatively low priority of the industry in terms of industrial development results in the Chinese requiring that all projects be self-sufficient in terms of foreign exchange. The companies are all realistic in understanding that the pharmaceutical industry is not China's most important development priority.

There are two important government agencies involved in investment decisions. The first is the Ministry of Public Health, which has responsibility for achieving the government's public health goals. One, for example, is

the elimination of hepatitis B by 1990. The Ministry of Public Health is primarily concerned with the health care benefits a firm can offer. The State Pharmaceutical Association, however, is most interested in the economic benefits a joint venture can permit. These could include the revamping of existing plants, the supply of necessary production inputs (i.e. gelatin capsules), or the generation of foreign exchange.

Based on the observations of those I interviewed, it appears that the Chinese are most interested in:

a) specific products, especially those replacing imports or allowing for the upgrading of the Chinese industry to international standards (ex. gelatin capsules);

b) advanced production technology (including upgrades to existing plants) to improve the productivity (cost) and quality of their products;

c) unfamiliar technologies (ex. recombinant DNA and mutation selection procedures); and

d) export oriented projects.

Firms trying to develop a market within China for specific drugs or unwilling to commit their latest product and process technology find themselves frustrated in their negotiations. Companies F and G both voiced considerable frustration over their inability to settle on a project of

mutual interest to themselves and the Chinese. Company F invested a lot of energy in building a relationship with the Ministry of Public Health, and has gotten much positive input from the Ministry on its products. It has been unsuccessful so far at translating these into projects the SPA is interested in. After a number of requests to the SPA for project definition, it finally submitted several with the expectation that at least one may lead to something. Company G is focusing on trying to find a match where it can provide an older technology to China that will give the Chinese cost advantages. On the surface this would appear to be consistent with the Chinese goals. In specific cases, however, company G has been beaten out in negotiations by other firms willing to offer a more current technology (and probably better terms).

Given that the firms intend to invest, how do they find China as a place to do business?

Foreign Exchange Provisions of Foreign Investment Regulations

The one issue that the firms most frequently agreed is the most difficult one facing them in their

relationship with China is the requirement to be self-sufficient in foreign exchange. The joint ventures, both those approved and those in process, all require the ventures to earn enough foreign exchange to pay for imports of both raw materials and capital goods, to repatriate profits, and to repay any loans taken out in foreign currencies.

The firms which have signed joint venture agreements appeared very vague as to how they intend to satisfy this requirement. One approach is to locally source as much material as possible, including capital goods where at all feasible. One firm said it would not take on a loan in U.S. dollars to finance a project because of the foreign exchange constraint. One company approaching a joint venture (E) is currently held back by concerns over satisfying the exchange balancing requirement.

Several firms (companies A, B, and E) are clearly hoping they will find means to satisfy the requirement in ways other than exporting the goods manufactured by the joint venture. Some are hoping to do so by making purchases from China unrelated to the activity of the joint venture. For example, one of the companies currently buys a significant amount of raw material for its chemical division from China. It has been seeking approval to allow this purchase to offset its joint

venture's foreign exchange needs. Other potentials cited by firms include three way trade arrangements in which they would purchase unrelated or quasi-related Chinese goods for immediate resale outside China. Firms assume that this would be no more than a stopgap measure because others (including the Chinese) would quickly step in to eliminate the intermediary role. Firms engaged in multiple joint ventures hope to be allowed to offset foreign exchange earnings and losses between the foreign firm's ventures and not on a venture by venture basis.

To date, only the three way trade method is allowed, although firms view it very negatively. Material purchases or other joint venture exchange earnings have not been allowed to count against a given venture's required balancing. As mentioned before, in early January, the Chinese government announced that it was taking two steps to ease the problem. One of the companies with a joint venture stated that it feels they contributed to the decision of MFERT and the Bank of China to propose these changes.

Several of the companies were uncharacteristically critical of their competitors over this issue, claiming that they made commitments to balance foreign exchange with no idea how they intended to satisfy them. Based on my interviews, that accusation is true, and the companies

assumed that a legal means would open up to them. If the current proposals had not been made the firms would have been stuck with attempting to distribute Chinese produced drugs internationally, an action none seemed very interested in taking. The very different interests of the Chinese and the foreign firms, as well as the Chinese emphasis on adhering to contract principles, make such unstated intentions very risky. Many of the most publicized joint venture problems have apparently arisen from just such problems (ex. American Motor Corporation's vehicle factory).

No firm feels profit repatriation will be a problem as long as foreign exchange is available. Two firms (companies H and I) suggested handling it through transfer pricing. I believe this method would be very risky as the Chinese become more sophisticated in their understanding of the international pharmaceutical market. Transfer pricing has been a major issue in developing countries for years, and I believe the Chinese will take a very dim view of anyone who attempts to repatriate profits in this way unless it is contractually indicated.

If the Chinese are genuinely motivated to develop an expanded export market in pharmaceuticals, their current proposals are likely to work against them. If the regulations remain as they are however, the climate for

continued investment there would worsen from the pharmaceutical firms' perspective.

Negotiations and Decision Making

The companies involved in the study are at all different phases of the negotiating process, so thus find it a more or less important issue for them currently. They all characterized the Chinese as skillful negotiators who bargain intelligently and persistently. They advised patience and consistency.

The four firms which have already signed joint venture agreements spent three to five years in the process of negotiating. Much of this period was spent in developing a relationship, both between institutions and between individuals.

Firms find it critical to be on good terms with both the Ministry of Public Health and the State Pharmaceutical Administration. Although most of the joint ventures have been signed with provincial level pharmaceutical corporations, negotiations were conducted under the auspices of the SPA. Only one company (G) described the SPA as being relatively unimportant in the decision making process. In this firm's view, the SPA is restricted to passing judgment on technology transfers, while investment

decisions are made at the provincial level. Other firms described it differently. One commented that were it to do it over again, it would place more focus on ensuring the proper selection of provincial level authorities to work with. It had been guided to its partner and now believes it could have made a better choice.

Those who initiated discussions with provincial authorities without strong state involvement were frequently frustrated by the province's (municipality's) narrow focus on such items as market potential (company G). At the same time, even the most successful firms are uncertain where power rests between the SPA and provincial company. One very experienced executive (company D) said he gave up trying to identify formal lines of authority some time back. Instead, with experience, he has learned to identify which individuals seem to be able to make which decisions, and turns to them as appropriate. It has obviously been a workable approach for him, although it is a difficult one to transfer to a new player.

Firms that have focused too much attention on developing Ministry of Public Health relations at the expense of the SPA also appear to have trouble concluding joint ventures. The relationship between the Ministry of Public Health and SPA was characterized by one executive as being cool and distant, with each internally focused on

its goal set and hard at work to protect its turf. Interagency cooperation and even communication were described as limited. He felt it is crucial to develop good relationships with both sides. Given his firm's success in forming ventures in the PRC, his advice appears sound.

Developing relationships with the Ministry and SPA is undoubtedly time consuming. Activities used to build Ministry relationships include sponsoring medical symposium (company A), sending eminent scientists to lecture in China (companies A and F), and bringing Chinese scientists to the U.S. for tours and training. The SPA has been courted through bringing key individuals to U.S. plants for tours and briefings.

In addition to institutional relationships, firms have also found it valuable to develop personal relationships with the Chinese negotiators. Most did this through attempts to ensure their chief negotiators remained in place throughout the process. One of the firms with a joint venture said this continuity of personnel has been key throughout the buildup of its venture. Five of the ten members of its joint venture board have been in place for four years and were also involved in the preceding negotiations. This has prevented reinterpretations of contract provisions.

Having Chinese speaking negotiators (as opposed to relying on translators) was also regarded as valuable. The negotiating teams were based in Hong Kong or the U.S. One company whose team was based in a Japanese subsidiary reported poor results (company F). The companies generally felt that it was good that the negotiating team was not resident in Beijing, even when the firm had an office there. They felt it allowed for necessary blocks of time between sessions for the Chinese to engage in their slow decision making process. It also gave the teams some deadline pressure -- up against a departure deadline, controlled by the foreign firm, they felt the Chinese negotiated more favorably.

There was a wide divergence of views on the role of senior executives in the firm in the decision process. Most began their activities in China in the late 1970's or early 1980's with a visit by their CEO or chairman. In some cases, this individual participated in generating the initial letter of understanding. At this stage, middle managers would stepped in to undertake the detailed negotiations, with the senior officials returning for the signing ceremonies.

This pattern was not followed by all firms. One firm with a joint venture involved the president of its international division throughout its negotiations. In

another firm (F), where negotiations have been bogged down for some time, it was recently decided that the CEO should visit China. With the assistance of a consultant, meetings were set up with Chinese dignitaries (including a former vice premier). As a result of this trip, company F is much more confident about the prospects of a joint venture being approved.

The firms which had signed joint venture agreements offered considerable general advice.

A key point is that patience is essential. It is important not to attempt to push decisions too quickly. Company A commented that a firm needs to be prepared for interruptions lasting up to a year. Company A also suggested that if more than one joint venture is being negotiated, concessions gained in one set can often be gained quickly in another. The Chinese appear to make decisions more quickly in the face of precedents, even when the precedent was established outside their immediate bureaucracy.

Likewise, the firms insisted it is essential not to give up on important points and to be prepared to walk away from the table. Firms frequently found that a firmly stated position in response to an outrageous request late in the process would be quickly capitulated to, often to their surprise.

One firm required that a portion of the negotiations be conducted in the U.S. (at the firm's expense). The firm found this very helpful at counteracting the inevitable advantage the Chinese have when negotiations are always held in China.

Firms also counseled calm in the face of repeated efforts by the Chinese to reopen issues previously assumed closed. It is essential in such circumstances to restate the agreement and remain firm. Overall, however, as in any meaningful negotiations, firms must be prepared to make concessions during the negotiating process.

Everyone thought their negotiators were empowered to make decisions, although the successful firms (in terms of coming to an agreement), said it was important to leave considerable time between sessions for the consensus process to work.

Firms differ considerably in the degree of detail in their contracts. One believed its highly detailed contract would be key to its future success. One firm would be much less detail oriented the next time around. Since only one U.S. pharmaceutical firm is in production in China currently, it is too early to judge the importance of detailed contracts.

One comment made by several firms with negotiations spanning many years was the growth in the understanding by

the Chinese of both the pharmaceutical industry and business practices. Five years ago, negotiating sessions tended to be educative in focus, describing how business was conducted internationally. Much of that education has now been completed and Chinese negotiators are much more sophisticated.

Firms with non-joint venture forms of agreement -- licensing, compensation trade -- found negotiations to be much quicker, taking generally less than a year.

Negotiating with the Chinese is regarded by the firms as time consuming and intricate. There have been so many successful negotiations at this stage though that it no longer needs to be a mysterious process. First, it is important for the foreign firm to develop a relationship with the Ministry of Public Health and the SPA. With their input, a provincial level corporation should be identified to work with. Chinese objectives should be evaluated for a matching with the firm's capabilities. Once negotiations are initiated, the foreign firm should be prepared to take time to come to an acceptable agreement.

Agreement on the remaining difficulties of conducting business in China was much less focused. One firm felt management issues would dominate in the future. Another was concerned about infrastructural weaknesses, and a few

were worried about access to local markets, the continuity of foreign investment regulations, and the protection of proprietary information.

Ownership Issues

All the firms expressed comfort with the degree of equity participation they either were committed to or anticipated getting. Firms appear to prefer an equity role over the more limited fee basis of a license because it allows for more growth over time. Firms are generally positive about having a Chinese partner, even when their customary practice is to only support wholly owned subsidiaries outside the U.S. They feel that in the Chinese economy they need an active and influential partner. Firms wanting more than a 50% stake found it tough to achieve initially, although that barrier has since been broken.

Few of the firms interviewed have had an opportunity to assess their level of actual control over the venture. Some believe they will in fact have control; some believe the Chinese will. Generally speaking, however, no one seemed especially concerned about this. In some cases the chairman is to be Chinese (company D) with the vice chairman an expatriate. In some cases, the reverse is

true (companies A and B). Pricing and profit levels are the only issues mentioned as potential areas of conflict, and only by one company.

Infrastructural Weaknesses

Infrastructural weaknesses exist in the provision of basic utilities (power, transportation, communications), the overall level of industrial development (equipment standards), and the availability of supplies of raw materials. In general, firms were relatively unconcerned with these and assume the Chinese partner will handle them. Several commented that the infrastructure is similar to what is found in other developing countries with which they are familiar (companies A, B, C). Comments were made that you had to avoid doing anything stupid (such as locating in the western deserts) but that otherwise some problems were to be expected.

Company C has faced some unexpectedly serious problems. It found itself without construction materials (cement, steel beams) in the midst of construction. Its Chinese partner showed little initiative, and for a while company C was engaged in construction material importing. This ground to a halt with the foreign exchange restrictions imposed in 1985, and company C was left

scrambling. Company D, however, found its construction process went very smoothly, with no lack of materials. It accounts for this by saying it left all responsibility for construction to its Chinese partner.

The only other problem of infrastructural weakness cited by the firms is the availability of local sources of raw material supply. In order to minimize their foreign exchange obligations, firms want to use Chinese sources as much as possible. Companies (including A, B, and D) are going to great lengths to develop these sources, including sample testing and providing technical information to improve quality. A particular concern for product to be exported is the generally low quality of packing materials, including such items as vials and rubber stoppers. Suppliers appear eager to improve quality but on time delivery was frequently mentioned as a major problem (companies A and E).

Access to Local Markets

Only one firm appeared to be concerned with product distribution within China, and that was company G. The executive I spoke with there said the biggest issue facing foreign companies in China was how they were to have access to this potentially great market.

Most firms appear to assume that the market will come to them. Distribution of the product is specified in the contract as a Chinese partner responsibility. Company A said it insisted the joint venture's budget include funds for developing a professional marketing and sales organization, although the need for this was disputed by the Chinese. Everyone feels demand for their product will be so high that distribution is unimportant. Although this is likely to be true in the short run, it would seem very unwise to bank on it longer term. Company E commented that recently the Chinese partners appear more interested in and knowledgeable of product distribution.

The lack of data on market size is a major weakness in the eyes of company D's executive. Without such data, it was difficult to project his plant's size, equipment needs, and production mix. Over the next few years he hopes to have the joint venture become more active in product distribution in order to learn more about the market. Johnson & Johnson got around this dilemma by undertaking research in one thousand hospitals to assess health needs before committing itself to a joint venture.

Firms seemed pleased with their access to material markets, with the reservations on quality and delivery timeliness expressed elsewhere. Company D said it is important to compare the prices of locally supplied inputs

to international prices to assure fairness. It also described land rents as being outrageous and comparable to Hong Kong's.

Firms also appeared to be satisfied with their access to labor markets, although some find they have to provide housing and transportation (company C). Company D described compensation practices as being very tough to handle on a day to day basis because of the narrow range allowed for salaries. Company D would like to go further in rewarding its venture's Chinese employees but realizes it must move cautiously. For one thing, half its board is Chinese and reluctant to see large salary differentials. Without such incentives, company D feels progress will be slower than it could be.

Continuity of Foreign Investment Regulations

For the most part, companies felt that once a contract was signed with the Chinese it would be honored. Although they understood that the Chinese do not take the same legalistic approach to contracts as U.S. businesses do, they feel the Chinese are trustworthy. Changes would only be made if some critical environmental change occurred, and the companies felt they were likely to understand the change.

Firms tend to discount historical experience in this area. Several commented that they feel the contract cancellations of the 1979-80 massive readjustment period are unlikely to happen again. The unannounced tariffs and other actions implemented in 1985 to deal with the foreign exchange crisis do not seem a source of concern either. This conviction that contracts will be honored has held up in spite of the experience of company C. Its contract specified that it was to have a two year holiday on the foreign exchange balancing requirement. This was reneged on without explanation and applied, as far as company C knows, to all existing contracts with this provision. As a result of this experience, company C is now concerned it may face other changes. Only one other company lacked confidence that contracts would be honored, and that was company G. The executive there said that a year ago he was much more confident that agreements would be honored, but observations over the last year have reduced his confidence.

Firms pointed out that in contrast to many developing countries in which they operate, the changes they may see are likely to be rational in basis and consistently applied. Corruption was viewed as being nonexistent within the realm they operate in, and unlikely to cause

arbitrary and capricious changes to their status in the P.R.C.

It is clearly naive to believe that once a contract is signed with a Chinese partner it will remain intact through its term. At the same time, however, it is probably unlikely that contracts will be constantly abused. A firm would be unwise to base its fortunes in China on a few contract details at any rate.

Protection of Proprietary Information

The pharmaceutical industry is heavily R&D based, as are all the firms included in the interviews. In spite of this, the protection of proprietary information was not a high priority issue in anyone's mind.

China's recently enacted Patent Law is of little value to these companies because it does not cover pharmaceutical preparations, only pharmaceutical processes. Other important markets have similar laws, for example Spain, Taiwan, Latin America, Eastern Europe, and Korea. The companies, while complaining, have accommodated. The four companies with joint ventures said it was not a deterrent at all, and at least one of them will produce patented drugs in China.

Company F was concerned that the Chinese would appropriate both the product and process technology. They could then market a "me too" form of the drug (a generic version) throughout Southeast Asia.

The others expressed the opinion that contract requirements restricting the Chinese to internal distribution will protect their technology. While it may protect them from external distribution, they may find other Chinese companies manufacturing the product outside the joint venture for internal distribution. That is of course speculative at this stage because the joint ventures are relatively recent.

Political Stability

The firms interviewed all appear confident that China's internal program of modernization will continue and that Deng's succession will proceed smoothly. All the executives said that questions about the political stability of the country had not been or were not currently a factor in their decision making process.

Several cited external sources for the basis of their views, including information provided by the National Council for U.S.-China Trade and consultants (including Henry Kissinger). None seemed to have internal sources of

political analysis. Some argued that China has gone too far in giving its people a taste of "the good life". Others felt it had to stay stable to ensure a successful Hong Kong (and later Taiwan) unification.

Some commented that they do not worry because they are not investing that much anyway, although political risk are not constraining their investment.

Company H was a little more doubtful, describing China as chaotic and its growth haphazard. That in itself does not appear to be a factor in its decision not to invest in an equity relationship with the Chinese.

One executive verbalized what they all seemed to feel when he asked me what they could do about it anyway. Most of these firms have extensive international activities, earning between 30% and 45% of their revenue outside the U.S., with about a third of that in Asia. They limit their risks overall by cultivating relationships with several constituencies, trying to ensure their product meets indigenous needs, and limiting -- whether consciously or unconsciously -- the size of their investments.

Conclusion

The interviews with pharmaceutical firm executives revealed that most are acutely aware of the shift in their markets towards increased government control and reduced costs. They clearly understand the need for and value of worldwide distribution of their products.

To a large degree, the objective of maximizing product distribution has driven firms to attempt to invest in China. The large potential market has clearly motivated firms to invest resources where they might otherwise shy away.

Firms have not been motivated to invest in China by its potential to serve as a low cost base for exports. There is no question but that the prices of some Chinese production factors (such as land rent) make it difficult to evaluate its cost competitiveness vis a vis other countries. The troubling element, however, is that firms frequently argued that "production economies" or low cost product is not a source of competitive advantage in the industry.

Firms also seem to see little potential for research or development activities in China. They look on the technology transfer as being from their firm to the Chinese well into the future. This perspective appears to

overlook the intrinsic Chinese capability as well as China's stated interest in developing its own R&D capacity.

Although market size was stated as the major reason for firms' activities in China, firms in fact appear to pay little attention to how they will be able to access the market in their relations with the Chinese. There is a high degree of reliance placed on the Chinese partner to handle product distribution. Although alternatives to this may be few or nonexistent, it seems to pose a major risk for foreign firms.

Firms' overall assessment of the political and economic issues involved in doing business in China is generally optimistic, certainly more so than the analysis presented in chapter three. Most of them are confident that China will evolve towards a free market economy. The many economic obstacles are viewed, in most cases quite rightly, as little more than nuisances.

In the firms' defense, they seem to be fairly open to transferring some technology and adopting new ways of doing business. This openness appears to be as much a response to Chinese requirements as it does a recognition of a new means to competitive strength, however. Few firms appear to initiate proposals to the Chinese that are

uniquely suited to its particular environment. Most seem to base their approach on successful entries elsewhere.

CHAPTER SIX

CONCLUSION

Firms in the pharmaceutical industry appear to be approaching China as an increment to their business activities elsewhere. Decisions to invest are not based on sophisticated strategic analyses of Chinese business opportunities and their interrelationship with global imperatives. The decisions are based on lessons learned from experiences elsewhere and a willingness to take a risk with projects with fairly uncertain returns. This is not all bad. Strategic considerations suggest that firms should actively pursue opportunities in China, although firms would benefit from considering a broader array of options.

The thesis began by identifying the major trends in the pharmaceutical industry from a worldwide perspective. The most significant trend is the maturing of the industry, both in terms of overall demand for drugs as well as in the rate of innovation. New technologies,

demographic shifts, and worldwide economic growth could lead to an acceleration in the industry's growth, but these forces move slowly. A sign of the maturity is the shift in competitive advantage away from being exclusively research and development capability to cost. Pressures on product cost are arising primarily from governments burdened by overall high levels of health care expense. As governments increasingly insert themselves into the function of providing health care, the customer is shifting from the individual medical professional to cost conscious quasi-governmental bodies. The response to cost pressures is arising less from changes in the traditional firms' modi operandi than from the rise of a new group of competitors, the generic drug suppliers. The Japanese firms, long dominant in their home market but unimportant players worldwide, are beginning to reap the benefits of high rates of growth in R&D spending, in effect planning to beat the traditional international firms in the area of their greatest strength.

Three conclusions were drawn from these trends in the industry. One is that firms must actively seek to lower their products' cost to the customer by tackling all elements of the value added chain. Attention to product development and distribution costs is seen as being as critical as reducing manufacturing costs.

A second conclusion is that firms must seek worldwide distribution of patented product to recoup research and development costs. This becomes increasingly important as R&D costs skyrocket and generic drugs threaten to take away market share and margins upon patent expiry.

A third conclusion is that the increasing role of governments in this industry, and the changes in that role, dictate that firms develop new ways to be responsive to national government concerns.

Focus on all three of these areas is necessary for a firm to sustain a competitive advantage in this industry.

The "push" of worldwide industry trends must be matched by the "pull" of specific options in any country in which a firm is considering operating. The recent opening of China to foreign investors presents new opportunities for firms. Properly identifying those opportunities and then realizing them so as to be profitable is a major undertaking, however.

The Chinese business environment, i.e. the political and economic context in which it operates, was characterized as inflexible. This inflexibility requires that firms carefully plan their activities there and not operate reactively. A further factor critical for success appears to be an appropriate meshing of Chinese and foreign firm objectives. Chinese objectives are to

upgrade their technology base and build up exports. The degree to which foreign firms can synchronize their objectives with these will determine to a major degree their success.

Another factor of the Chinese business environment firms must be aware of is the high level of uncertainty regarding its future. It is well and good to talk of being in China for the long term, but plans in the face of other outcomes should be prepared.

The general business environment in China shapes the opportunities available to pharmaceutical firms there. The Chinese pharmaceutical industry is attractive because of its size, relative sophistication, and long term potential to be a world class competitor. The role of the Chinese government is a major drawback for foreign firms, and significantly constrains the range of options available to them. Two areas of investment were identified as offering firms the greatest long range potential.

The first is to produce drugs in China for export, using China as a low cost production base. The drugs produced could be in bulk form for shipment to smaller Asian countries where they could be formulated and packed. Alternatively, they could be generic drugs intended for worldwide competition on the basis of low

cost. The Chinese motivation to boost exports should permit the existing anomalies of the price structure to be overcome.

A second opportunity for foreign firms is to access the Chinese market through an agreement to transfer technology. This is what virtually all foreign firms in China today are doing. Adopting this approach as an entry strategy without a longer term commitment to enhancing China's technical base appears doomed to failure. Continuing to transfer technology in one direction, from the home country to China, could eventually drain the foreign firm of its technical advantage in worldwide competition. A different approach would be to develop R&D capability within China so that the technology transfer could eventually be in two directions. While this may seem farfetched to some, the large number of joint R&D agreements already consummated hints at the potential. Promising areas of research might begin with therapies for common tropical diseases. Such research is frequently unprofitable in the developed countries because of the limited economic power of such diseases' sufferers. China's lower R&D costs could well remedy that.

Interviews with pharmaceutical firms suggested they are only responding to a portion of these opportunities. The interviews also revealed the tendency for firms to

view China as simply another place to do business, without critically examining its environment.

Firms are in China in order to achieve worldwide distribution of their product. They are also there as logical increments to activities elsewhere in the world. They are not there to develop a low cost production base. The firms frequently commented that they feel the Chinese see themselves as a source for low cost drugs. They had two responses. One was to deny that China could be a low cost source of drugs for them, arguing that the complexities of doing business in China and the distorted internal prices lead to Chinese drugs' costs being comparable to those produced elsewhere. The other response was that cost is not a basis for competitiveness in the industry and that it is therefore not a valid reason to invest there. To these I argue that cost is an issue for the industry, and that China's recent success in exporting bulk drugs suggests it has the capability to be a low cost supplier.

Firms are also not there to participate in China's future innovation potential. Few firms look at China as other than a market. It may in fact have something to offer companies other than immediate profits from sales.

Firms are quite optimistic about the Chinese business environment. They are highly influenced by their

perceptions of the Chinese value system and in particular the Chinese spirit of entrepreneurial activity and hard work so visible throughout the world. These appear to have more influence on their views of China as a place to do business than a factual analysis based on events in China over the past few years.

A major indication of their optimism about China is their low level of concern over how they will have access to the Chinese market. Although such access appears to be their motivation for entering China, they are relatively unconcerned with it and have left it to their Chinese partner to handle. The fact is they may have little ability to handle it directly themselves, but it represents an uncertainty they should be concerned about.

In evaluating China as a place to do business, firms' focus is currently restricted almost completely to the requirement to balance foreign exchange. Firms do not appear to be particularly concerned about the other issues related to doing business there. Their generally high level of optimism appears naive until one considers that many of these executives, and their firms, have faced very tough business environments elsewhere in the world. Most relevant, perhaps, are their currently very negative experiences in Latin America, and their history of antagonistic relationships with the governments of India

and Indonesia. Firms frequently mentioned China and Japan in the same breath, suggesting that China is likely to follow Japan's path to development. They feel that it is entirely realistic to maintain a viable long term presence in China as an independent entity. The analysis presented here calls that into question. Without a thoughtful and ongoing assessment of the economic and political environment in China I fear the firms may end up failing to accommodate over time and end up bitter and angry over their experience in China.

In line with the industry imperative of seeking new ways to be responsive to national government concerns, the firms have been open to transferring technology and conducting business in China in new ways. The firms undertaking joint ventures now are engaged in some level of technology transfer and are thus I believe acting consistently with Chinese objectives. Firms hoping to supply old technology or engage in only the most superficial packaging will not succeed. Likewise, firms hoping to establish a low technology trademarked product (especially an OTC drug) in the Chinese market are, I believe, on the wrong track.

Although there are some national distinctions between firms' activities, they do not seem to point to any particularly significant differences in the perception of

trends. U.S. firms have been the most active, with European firms generally playing a very low-key role. The Japanese firms have been most active in establishing joint research efforts, although many of these are to pursue herbal medicines' efficacy and safety.

On balance, the U.S. pharmaceutical firms are acting in a fashion consistent with the trends in the industry at large, with the exception perhaps of actively pursuing all opportunities to reduce cost. They recognize China as a new opportunity to increase product distribution, although they stop short of seeing the other opportunities it provides. Their optimism about the future business environment in China could prevent them from taking actions they should be taking now to better assure long term success.

For an industry facing a more difficult future than it has experienced historically, a major new market such as China represents a form of relief. To convert that temporary reprieve into long lasting success will require a careful tuning of their business relationship with China as well as a more vigorous response to global industry pressures in general.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): AICC (U.S.)

CHINESE ENTERPRISE(S): Giulin Pharmaceutical Factory No. 3

NAME OF JOINT VENTURE COMPANY: Nanhua United Pharmaceutical Co.

LOCATION:

TOTAL INVESTMENT:

EQUITY SHARE:
FOREIGN FIRM:
CHINESE ENTERPRISE:

LENGTH OF AGREEMENT:

KEY DATES:

BUSINESS SCOPE:
Joint venture to manufacture cefazolinum antibiotic. Chinese to provide fully equipped factory space and management. U.S. firm to supply technical expertise and some raw materials.

SOURCE:
Medical China 1 (Winter 1985): 78.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Astra, Kabi-Vitrium, Ferring, Ferrosan, Leo (Sweden)

CHINESE ENTERPRISE(S): China National Pharmaceutical Industry Corporation

NAME OF JOINT VENTURE COMPANY: Sino-Swedish Pharmaceutical Corporation

LOCATION: Wuxi

TOTAL INVESTMENT: $24 million. First phase: $12 million ($4 million from five companies, $2 million from Swedfund foundation for industrial cooperation in developing countries; $6 million from Chinese). Second phase: Additional $12 million if initial venture successful.

EQUITY SHARE:
FOREIGN FIRM: 50%
CHINESE ENTERPRISE: 50%
Board consists of 8 directors, 4 selected by the Swedish partners and 4 by the Chinese. The chairman is to be selected by the Chinese, and the vice chairman by the Swedes.

LENGTH OF AGREEMENT: 20 years.

KEY DATES:
Approved May 1982. In operation 1986.

BUSINESS SCOPE:
Joint venture to produce Swedish drugs (including Intalipid--a fat emulsion, Vamin--an amino acid, and hypertension drugs) in China. Approximately 30% of output will be exported to cover foreign currency outlays for imported bulk pharmaceuticals from Sweden.

SOURCES:
Business China VIII (27 October 1982): 158.
China Business Review 9 (November/December 1982): 5.
China Business Review 10 (September/October 1983): 22.
Far Eastern Economic Review, 11 April 1985, p. 60.
Financial Times (London), 8 November 1984, p. 6.
Journal of Commerce, 22 September 1982, p. 23B.
SCRIP 678 (24 March 1982): 5.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Biogen N.V. (Netherlands) (recombinant DNA technology company)

CHINESE ENTERPRISE(S): Shaanxi Pharmaceutical Bureau

NAME OF JOINT VENTURE COMPANY:

LOCATION: Shaanxi

TOTAL INVESTMENT:

EQUITY SHARE:
FOREIGN FIRM:
CHINESE ENTERPRISE:

LENGTH OF AGREEMENT:

KEY DATES:

BUSINESS SCOPE:
Biogen to provide gamma interferon (used in treating cancer) for clinical trials in China. If acceptable, then Biogen to supply bulk gamma interferon for finishing, testing and marketing in China. Biogen to train Chinese in recombinant DNA and mutation selection techniques in Swiss and U.S. labs.

SOURCES:
Business China X (25 January 1984): 14.
Chemical Marketing Reporter, 2 January 1984, p. 60.
Chemical Week 133 (14 December 1983): 36.
New York Times, 7 December 1983, p. D5.
SCRIP 855 (14 December 1983): 6.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Chinese-Japanese Tonic Medicines Co. Ltd. (P.R.C./Japan), unnamed Japanese firms

CHINESE ENTERPRISE(S): Dongfeng County Pharmaceutical Factory

NAME OF JOINT VENTURE COMPANY:

LOCATION: Jilin

TOTAL INVESTMENT:

EQUITY SHARE:
FOREIGN FIRM:
CHINESE ENTERPRISE:

LENGTH OF AGREEMENT: 15 years

KEY DATES:
Agreement signed 22 December 1984.

BUSINESS SCOPE:
Joint venture to produce ginseng extract and antler powder.

SOURCE:
China Business Review 12 (July/August 1985): 67.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): ImmunoGenetics (U.S.), KaiTai group of companies (Hong Kong)

CHINESE ENTERPRISE(S):

NAME OF JOINT VENTURE COMPANY:

LOCATION:

TOTAL INVESTMENT:

EQUITY SHARE:
FOREIGN FIRM:
CHINESE ENTERPRISE:

LENGTH OF AGREEMENT:

KEY DATES:

BUSINESS SCOPE:
Joint venture to manufacture pharmaceuticals and other products in Shenzhen Special Economic Zone for Chinese use and export to Southeast Asia. Primary products to be poultry and duck vaccines.

OTHER:
ImmunoGenetics Chairman Dr. Edward Hager was quoted as saying "Being able to produce vaccines in such a labour economical environment offers significant price advantages to our present and future customers throughout the region." (SCRIP 1025 (14 August 1985): 13.)

SOURCES:
Journal of Commerce, 30 July 1985, p. 21B.
SCRIP 1025 (14 August 1985): 13.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Janssen Pharmaceutica N.V. (Belgium), a wholly owned subsidiary of Johnson & Johnson (U.S.)

CHINESE ENTERPRISE(S): Shaanxi Pharmaceutical Industry Corporation, China National Corporation for Pharmaceutical Technical and Economic Cooperation, and Hanjiang Pharmaceutical Factory

NAME OF JOINT VENTURE COMPANY: Xian-Janssen Pharmaceutical Project

LOCATION: Hanzhong, Shaanxi

TOTAL INVESTMENT: $30 million

EQUITY SHARE:
FOREIGN FIRM: "major shareholder" (SCRIP 989/990 (15 April 1985): 18.)
CHINESE ENTERPRISE:

LENGTH OF AGREEMENT:

KEY DATES:
Negotiations began in 1983. Agreement signed April 1985. Construction started late 1985. Production to begin late 1987.

BUSINESS SCOPE:
Joint venture to produce up to 34 Janssen products in a new facility to be constructed. The facility will include a small chemical plant for necessary basic materials, a pharmaceutical plant for end products, a water purification system, and administrative and service buildings. The products will consist of anaesthetics and antiparasitics. The project is expected to employ 600 people by 1988. Chinese to handle engineering and construction on the project. Belgians to design the production buildings and train Chinese executives and engineers in both China and Belgium.

OTHER:
The venture agreement was preceded by detailed preparatory research in over 1000 hospitals to determine the health needs of the population. This followed Janssen's earlier compensation trade agreement in Shaanxi province (see Appendix B).

SOURCES:

"Largest Ever Joint Pharmaceuticals Project Signed Between Janssen Pharmaceutica and the People's Republic of China," Belgian American Trade Review (May-June 1985): 16-17.
Medical China 1 (Winter 1985): 78.
SCRIP 989/990 (15 April 1985): 18.
SCRIP 994 (29 April 1985): 13.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Otsuka Pharmaceutical Co. (Japan)

CHINESE ENTERPRISE(S): China National Pharmaceutical Industry Corporation

NAME OF JOINT VENTURE COMPANY: China Otsuka Pharmaceutical Co. Ltd.

LOCATION: Tianjin

TOTAL INVESTMENT: $6.6 million

EQUITY SHARE:
FOREIGN FIRM: 50%
CHINESE ENTERPRISE: 50%

LENGTH OF AGREEMENT: 20 years (until 31 December 2000)

KEY DATES:
Agreement reached August 1980. Approved December 1980. In production late 1983.

BUSINESS SCOPE:
Joint venture to produce 6 million bottles of infusion preparations annually. 40% of output to Japan, 60% distributed within China by the Tianjin Pharmaceutical Purchasing and Supplying Station of the China National Pharmaceutical Industry Corporation. Production standards to conform to International Good Manufacturing Practice (GMP) code for pharmaceutical production.

SOURCES:
China Business Review 8 (March/April 1981):
China Business Review 10 (September/October 1983): 22.
Far Eastern Economic Review, 11 April 1985, p. 60.
Medical China 1 (Winter 1985): 70.
SCRIP 670 (24 February 1982): 7.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Promega Corporation (U.S.), Sinogenetik (Canada)

CHINESE ENTERPRISE(S): Luoyang Biochemical Factory, China International Trust and Investment Corporation (CITIC)

NAME OF JOINT VENTURE COMPANY: Sino-American Biotechnology Co.

LOCATION: Zhengzhou, Henan

TOTAL INVESTMENT: $1 million

EQUITY SHARE:
FOREIGN FIRM(S): Promega 20%, Sinogenetik 20%
CHINESE ENTERPRISE: Luoyang 50%, CITIC 10%

LENGTH OF AGREEMENT:

KEY DATES:
Contract signed January 1985.

BUSINESS SCOPE:
Joint venture to construct a genetic biochemical manufacturing facility. Chinese received the right to manufacture 49 products under a technology transfer agreement. Promega to transfer $250,000 in technology. Both foreign firms to provide training.

OTHER:
Joint venture preceded by an agreement between Promega and the Luoyang District Foodstuffs Co. to manufacture and market enzymes and reagents (see Appendix B).

SOURCES:
Business China XI (28 February 1985): 30.
China Business Review 12 (May/June 1985): 33.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): SmithKline Beckman (U.S.)

CHINESE ENTERPRISE(S): Tianjin Pharmaceutical Industrial Co.

NAME OF JOINT VENTURE COMPANY: Sino-American Tianjin SmithKline & French Laboratories Ltd.

LOCATION: Tianjin

TOTAL INVESTMENT: $10 million. Initial phase: $5 million. Second phase: $5 million.

EQUITY SHARE:
FOREIGN FIRM: 55%
CHINESE ENTERPRISE: 45%

LENGTH OF AGREEMENT:

KEY DATES:
Agreement signed October 1984. In production late 1986.

BUSINESS SCOPE:
Joint venture to produce drugs for the treatment of gastrointestinal, arthritic, parasitic, cardiovascular, gynelogic, and infectious diseases. First major product to be the anti-parasitic Zentel (albendazole). First phase is pharmaceutical agent factory producing 1 billion pills and 200 million capsules per year. Output is to be both exported and distributed internally. Second phase is chemical raw material factory, with all output to be exported.

SOURCES:
Business China XI (24 October 1985): 160.
China Business Review 12 (May/June 1985): 33.
China Economic News, 24 September 1984, p. 9.
Focus Philadelphia, 2 October 1985.
SCRIP 1040 (7 October 1985): 8.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): E. R. Squibb and Sons Inc. (U.S.)

CHINESE ENTERPRISE(S): Shanghai Pharmaceutical Industrial Corporation, Shanghai Investment and Trust Corporation, State Pharmaceutical Administration

NAME OF JOINT VENTURE COMPANY: Sinp-American Shanghai Squibb Pharmaceuticals

LOCATION: Shanghai

TOTAL INVESTMENT: $8 million. Each party to contribute $1 million cash equivalent and the joint venture to borrow $6 million.

EQUITY SHARE:
FOREIGN FIRM: 50%
CHINESE ENTERPRISE: 50%
Ten member board--five selected by Squibb, five by Chinese. Chairman is selected by Chinese, vice chairman by Squibb. Operating president selected by Squibb, vice president by Chinese. The role of the board is to decide financial and policy issues, such as changes in capitalization, changes in the business of the company, and major new investments.

LENGTH OF AGREEMENT: 15 years

KEY DATES:
Contract signed May 1982. Construction began in 1983. Production began in October 1985.

BUSINESS SCOPE:
Joint venture to produce up to 20 products, including antibiotics, vitamins, cardiovascular agents, antifungals, and steroids. Squibb to source three patented products there (Capoten, an ACE inhibitor, Corgard, a beta blocker anti-hypertensive, and Velosef, a cephadrine antibiotic). Two thirds of the products come from Squibb's product set; one third from Shanghai Pharmaceutical Industrial Corporation's. A technical cooperation agreement covers product formulation know how provided by Squibb (no royalties are involved). The product is primarily intended for the Chinese market carrying the label of the joint venture company as well as Squibb trademarks. Exports will carry a separate joint venture label. Exports will consume 20-25% of production. The plant was built to U.S. Good Manufacturing Practice (GMP) code. Turnover is estimated at $10 million per year. A new plant, designed and built by the Chinese, was constructed, containing $4 million of imported equipment.

OTHER:
First joint venture with 50-50 relationship between China and a U.S. company.
Squibb Medical System International (a division of Squibb) established an agreement with the Shanghai Medical Electronics Instrument Factory in mid-1984 to produce and distribute ultrasound systems in the P.R.C.

SOURCES:
Business China VIII (22 December 1982): 185-186.
Business China XI (24 October 1985): 160.
Chemical Week 131 (17 November 1982): 23.
China Business Review 12 (May/June 1985): 33.
China Daily, 23 October 1985, p. 2.
Far Eastern Economic Review, 11 April 1985, 60.
Journal of Commerce, 23 July 1984, p. 23B.
Medical China 1 (Winter 1985):
New York Times, 27 October 1982, p. D9.
SCRIP 743 (8 November 1982): 6.

APPENDIX A

PHARMACEUTICAL MANUFACTURING JOINT VENTURES IN CHINA

FOREIGN FIRM(S): Capsugel division of Warner-Lambert Co.

CHINESE ENTERPRISE(S): China National Corporation of Pharmaceutical Economic and Technical International Cooperation

NAME OF JOINT VENTURE COMPANY: Sino-American Capsugel (Suzhou) Ltd.

LOCATION: Suzhou

TOTAL INVESTMENT: $14 million

EQUITY SHARE:
FOREIGN FIRM: 50%
CHINESE ENTERPRISE: 50%

LENGTH OF AGREEMENT:

KEY DATES:
Agreement signed July 1985. Construction to begin spring 1986. Partial production by October 1987. Full production to be reached by March 1988.

BUSINESS SCOPE:
Joint venture to produce 2.5 billion hard gelatin capsules a year. Includes the import of eight production lines and necessary technology. An additional eight lines will be installed if the venture is successful in its first five years. The U.S. company is to provide machinery and technology, as well as train key managers and technicians in its Japanese capsule plant. The Chinese are to provide raw materials (pharmaceutical grade gelatin from a factory recently completed in Suzhou) and to construct the manufacturing facility. The factory will be China's largest gelatin capsule manufacturing operation when completed. It is expected to employ 200. Most of the output will be distributed in China; some will go to Southeast Asia.

OTHER:
Warner-Lambert signed a letter of intent with the Xinhua Medical Apparatus Instruments Factory for joint production of surgical scissors and forceps in October 1982.

SOURCES:
China Business Review 10 (January/February 1983): 52.
China Daily, 12 July 1985, p.
Medical China 1 (Winter 1985):
SCRIP 1018 (22 July 1985): 9.
Warner-Lambert World, p. 1.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Eisai Co. (Japan)

CHINESE ENTERPISE:

LOCATION:

KEY DATES:
Agreement December 1979.

BUSINESS SCOPE:
Agreement to offer analysis, extraction, and purification know-how of livestock organs for production of pharmaceuticals.

SOURCE:
China Business Review 7 (March/April 1980): 61.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Janssen Pharmaceutica N.V. (Belgium), a wholly owned subsidiary of Johnson & Johnson (U.S.)

CHINESE ENTERPRISE: Hanjiang Pharmaceutical Factory

LOCATION: Hanjiang, Shaanxi

KEY DATES:
Production started November 1983.

BUSINESS SCOPE:
Licensing and technology transfer agreement on a compensation trade basis. Janssen designed a chemical plant to produce raw materials, as well as a water purification plant and ancillary buildings. It supplied production machinery and technological know-how for the manufacture of mebendazole, an anti-internal parasitic for humans and animals. The drug is also on the WHO essential drug list. It supervised the building phase, as well as the starting up and running in of the facilities. Chinese performed actual construction work on the chemical plant, the water purification plant, and ancillary buildings. Janssen was compensated with product manufactured in the new plant.

OTHER:
This agreement preceded Janssen's current joint venture (see Appendix A).

SOURCES:
Belgian American Trade Review (May-June 1985): 16-17.
Business China X (25 July 1984): 111.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Lark Co. (Italy)

CHINESE ENTERPRISE(S): State Pharmaceutical Administration, TECHIMPORT

LOCATION:

KEY DATES:
Agreement September 1983.

BUSINESS SCOPE:
Contract to transfer technology for using cephalosporin C to produce vaccine strains and c.C.zincate.

SOURCE:
China Business Review 12 (November/December 1983): 51.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Pfizer (U.S.)

CHINESE ENTERPRISE: Beijing General Pharmaceutical

LOCATION: Beijing

KEY DATES:
Agreement June 1984.

BUSINESS SCOPE:
License

SOURCE:
SCRIP (11 June 1984): 9.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Promega Biotec (U.S.) (enzyme and lab reagent supply company)

CHINESE ENTERPRISE: Luoyang District Foodstuffs Co.

LOCATION: Luoyang, Henan

KEY DATES:
Letter of intent December 1983.

BUSINESS SCOPE:
Agreement to manufacture and market enzymes and reagents for Chinese markets. Promega would train scientists in the U.S. as well as send people to China to initiate manufacturing.

OTHER:
The Vice President of Promega Biotec said he expected the project to be "quite profitable ... without being a great cost to us." (Chemical Week) There is no published information regarding the success of activities pursuant to the letter of intent.

SOURCE:
Chemical Week 134 (11 January 1984): 16.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Rhone Poulenc (France)

CHINESE ENTERPRISE: State Pharmaceutical Administration

LOCATION:

KEY DATES:
Cooperation agreement May 1984.

BUSINESS SCOPE:

SOURCE:
China Business Review 11 (September/October 1984): 64.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Sanofi (France)

CHINESE ENTERPRISE: Ministry of Public Health

LOCATION:

KEY DATES:
Negotiations announced August 1983.

BUSINESS SCOPE:
Negotiations to transfer hepatitis B vaccine technology.

SOURCE:
China Business Review 12 (November/December 1983): 51.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Tanabe Seiyaku Co. (Japan)

CHINESE ENTERPRISE:

LOCATION:

KEY DATES:
License agreement May 1985.

BUSINESS SCOPE:
License agreement for infusion solutions. Tanabe Seiyaku to export bulk materials to China and provide the technical know-how to manufacture to finished products.

SOURCES:
China Business Review 12 (September/October 1985): 64.
SCRIP 1013 (3 July 1985): 10.

APPENDIX B

PHARMACEUTICAL NON-EQUITY VENTURES IN CHINA

FOREIGN FIRM: Teikoku Seiyaku Co. (Japan)

CHINESE ENTERPRISE:

LOCATION: Shanghai or Tianjin

KEY DATES:
Agreement May 1985.

BUSINESS SCOPE:
Contract to provide China with the technology to produce poultice medicines for sores and inflamed areas. Teikoku Seiyaku Co. also plans to jointly develop herbal medicines.

SOURCES:
China Business Review 12 (September/October 1985): 64.
Medical China 1 (Winter 1985): 79.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Biotech Research (U.S.)

CHINESE ENTERPRISE(S): Shanghai Cancer Institute

KEY DATES:
Agreement August 1983. 3 year agreement.

BUSINESS SCOPE:
Joint venture for development of monoclonal antibodies in diagnosis and treatment of cancer. Biotech to provide technological know-how and equipment. Chinese to provide staff and lab facilities.

SOURCES:
China Business Review 11 (January/February 1984): 50.
SCRIP 823 (24 August 1983): 6.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM: (Brazil)

CHINESE ENTERPRISE: Ministry of Public Health

KEY DATES:
Protocol signed August 1983.

BUSINESS SCOPE:
Protocol to cooperate in Chinese medicinal herb applications, acupuncture, treatment of cancer, and investigation of tropical diseases.

SOURCE:
China Business Review 10 (November/December 1983): 51.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): (France)

CHINESE ENTERPRISE(S):

KEY DATES:

BUSINESS SCOPE:
Collaboration agreement to undertake joint biotechnology research.

SOURCE:
Financial Times (London), 14 April 1984, p. 4.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Hoechst (W. Germany)

CHINESE ENTERPRISE(S): Shanghai Institute of Pharmaceutical Industry

KEY DATES:
Agreement March 1985. 10 year agreement.

BUSINESS SCOPE:
Cooperation agreement to undertake joint research projects on both chemically synthesized substances and plant extracts. Will include exchange of scientists and technicians, as well as research into new cardiovascular agents.

SOURCES:
China Business Review 12 (July/August 1985): 63.
SCRIP 981 (13 March 1985): 15.
SCRIP 1017 (17 July 1985): 9.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): (Japan)

CHINESE ENTERPRISE(S): Ministry of Chemical Industry

KEY DATES:
Protocol signed January 1983.

BUSINESS SCOPE:
Protocol on joint research on antibiotics for medical purposes.

SOURCE:
China Business Review 10 (May/June 1983): 55.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Newport Pharmaceutical International Inc., University of Texas System Cancer Center (U.S.)

CHINESE ENTERPRISE(S): Chinese Academy of Medical Science, Cancer Institute

KEY DATES:
Agreement June 1983.

BUSINESS SCOPE:
Agreement to development anti-cancer drugs using natural substances derived from Chinese botanical sources.

SOURCE:
China Business Review 10 (September/October 1983): 63.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Nippon Zeon Co. (Japan)

CHINESE ENTERPRISE(S): China Biotechnology Development Center

KEY DATES:
Agreement March 1985. 5 year agreement.

BUSINESS SCOPE:
Agreement to undertake biotechnology R&D to develop pharmaceuticals and perfumes.

SOURCE:
China Business Review 12 (May/June 1985): 53.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Nippon-Zoki Pharmaceutical Co. Ltd. (Japan)

CHINESE ENTERPRISE(S): Ministry of Public Health

KEY DATES:
Agreement reported March 1982.

BUSINESS SCOPE:
Agreement to form a hematology and immunology research center in Shanghai.

SOURCE:
China Business Review 9 (May/June 1982): 55.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Otsuka Pharmaceuticals Co. (Japan)

CHINESE ENTERPRISE(S): State Pharmaceutical Administration

KEY DATES:
Agreement reported April 1982.

BUSINESS SCOPE:
Agreed to cooperate to develop drugs from Chinese herbs. Five thousands plants used in Chinese medicine will be jointly analyzed to isolate the active ingredient and determine the appropriate illnesses to be treated.

SOURCES:
China Business Review 9 (July/August 1982): 54.
China Business Review 9 (September/October 1982): 34.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Pharmacia AB (Sweden)

CHINESE ENTERPRISE(S): State Pharmaceutical Administration, Shanghai Pharmaceutical Institute

KEY DATES:
Cooperation agreement May 1985.

BUSINESS SCOPE:
Agreement to transfer technology to assist Chinese to modernize their local pharmaceutical production. Cooperate in R&D with the Shanghai Pharmaceutical Institute.

SOURCES:
SCRIP 998 (13 May 1985): 12.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): (Sweden)

CHINESE ENTERPRISE(S): State Pharmaceutical Administration

KEY DATES:
Protocal September 1984.

BUSINESS SCOPE:
Protocol to cooperate in making new medicines based on Chinese medicinal herbs.

SOURCE:
China Business Review 11 (November/December 1984): 62.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Taisho Pharmaceutical Co. Ltd. (Japan)

CHINESE ENTERPRISE(S): China Academy of Medical Sciences, Institute of Medicine

KEY DATES:
Agreement March 1984.

BUSINESS SCOPE:
Agreement to develop new medicines from natural substances.

SOURCE:
China Business Review 11 (July/August 1984): 51.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Tsumura Juntendo Co.

CHINESE ENTERPRISE(S):

KEY DATES:
Agreement March 1981.

BUSINESS SCOPE:
Agreement to undertake joint research of traditional Chinese medicine.

SOURCE:
China Business Review 8 (July/August 1981): 73.

APPENDIX C

PHARMACEUTICAL R&D AGREEMENTS IN CHINA

FOREIGN FIRM(S): Yamanouchi Pharmaceutical Co. (Japan)

CHINESE ENTERPRISE(S): Chinese Academy of Sciences, Shanghai Institute of Materia Medica, Kunming Institute of Botany

KEY DATES:
Agreement June 1985.

BUSINESS SCOPE:
Agreement to cooperate on full scientific analysis of the composition of traditional Chinese herbal medicines. Will jointly develop new drugs from herbal ingredients.

SOURCES:
China Business Review 12 (September/October 1985): 64.
China Business Review 12 (November/December 1985): 62.
Medical China 1 (Winter 1985): 79.
SCRIP 1021 (31 JULY 1985): 19.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Autopack Ltd. (U.K)

CHINESE ENTERPRISE(S):

KEY DATES:
Sale announced January 1983.

BUSINESS SCOPE:
Sale of 32 automatic vial filling, feeding, rubber bunging, and cap spinning machines.

SOURCE:
China Business Review 10 (July/August 1983): 50.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Capsule Technology International (Canada)

CHINESE ENTERPRISE(S): Guangzhou Pharmaceutical Packaging Material Factory; Qingdao province

KEY DATES:
Guangzhou: agreement March 1984
Qingdao: agreement approx. May 1985
Construction estimated to take approximately one year.

BUSINESS SCOPE:
Sale of two turnkey capsule manufacturing plants, each with a capacity of 1.2 billion capsules per year. The first was to Guangzhou (valued at $2.8 million and characterized as a compensation trade agreement) and the second to Qingdao (valued at approx. $2.9 million).

SOURCES:
China Business Review 11 (July/August 1984): 55.
SCRIP 1001 (22 May 1985): 9.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Coppee-Courtay (Belgium), a subsidiary of Coppee Lavalin

CHINESE ENTERPRISE(S): Xian-Janssen Pharmaceutical Project

KEY DATES:

BUSINESS SCOPE:
Design plant for manufacture of anti-internal parasitics and anaesthetics, a water purification facility, and a guest house.

SOURCE:
Business China XII (27 January 1986): 15.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Hitachi Co. (Japan)

CHINESE ENTERPRISE(S): North China Pharmaceutical Factory, China Pharmaceutical Foreign Economic and Technological Cooperation Corporation, China National Technical Import Corporation, China National Machinery Import and Export Corporation

KEY DATES:
Sale announced December 1983.

BUSINESS SCOPE:
Sale of a liquid phase chromotograph for antibiotic analysis.

SOURCE:
China Business Review 11 (March/April 1984): 53.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): M. W. Kellogg (U.S.)

CHINESE ENTERPRISE(S): China Chengdu Chemical Engineering Corp., China National Chemical Construction Co.

KEY DATES:
Protocol signed February 1985.

BUSINESS SCOPE:
Joint venture to provide engineering and construction for projects in pharmaceuticals, chemicals, and fine chemicals.

OTHER:
M. W. Kellogg's fifth joint venture in China.

SOURCES:
China Business Review 12 (July/August 1985): 56.
SCRIP 987 (3 April 1985): 8.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): C. E. King Ltd. (U.K. pharmaceutical equipment manufacturer)

CHINESE ENTERPRISE(S): Sino-Swedish Pharmaceutical Corporation (2 orders); Sino-American Shanghai Squibb Pharmaceuticals Corporation (1 order)

KEY DATES:

BUSINESS SCOPE:
Sale of tablet sorting and packaging equipment.

SOURCE:
Business China XI (14 March 1985): 38.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Pharmaceuticals Production Consultancy Ltd. (U.K.)

CHINESE ENTERPRISE(S):

KEY DATES:
Contract signed March 1983.

BUSINESS SCOPE:
Contract to modernize and re-equip two pharmaceutical plants, including one in Shandong.

SOURCE:
China Business Review 10 (September/October 1983): 63.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Suzuken Co. (Japan)

CHINESE ENTERPRISE(S): Taiyuan Pharmaceutical Factory; Taigu Pharmaceutical Glass Factory; both in Shanxi

KEY DATES:
Announced June 1984.

BUSINESS SCOPE:
Taiyuan: design for bacteria free workshop to produce penicillin; Taigu: ampoule production line.

SOURCE:
China Business Review 11 (September/October 1984): 64.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): Westfalia (W. Germany)

CHINESE ENTERPRISE(S): North China Pharmaceutical Factory, China Pharmaceutical Foreign Economic and Technological Cooperation Corporation, China National Technical Import Corporation, China National Machinery Import and Export Corporation

KEY DATES:
Announced December 1983.

BUSINESS SCOPE:
Sale of two penicillin fluid extraction centrifugal machines.

SOURCE:
China Business Review 11 (March/April 1984): 53.

APPENDIX D

PHARMACEUTICAL EQUIPMENT SALES TO CHINA

FOREIGN FIRM(S): (unknown)

CHINESE ENTERPRISE(S): Tianjin No. 2 Central Pharmaceutical Factory

KEY DATES:

BUSINESS SCOPE:
Sale of machinery to make capsules. Financed by World Bank loan.

SOURCE:
Business China IX (10 August 1983): 118.

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