Globalization Challenge for Large Firms from Developing Countries: China’s Oil and Aerospace Industries

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In the epoch of global business revolution, the world’s leading firms have undergone a revolutionary transformation. Firms from developing countries are disadvantaged to compete on the global level playing field of international big business. This paper investigates the competitiveness of Chinese large firms on the global level playing field as China joins the World Trade Organization. Based on analysis of firms in two ‘strategic’ sectors: oil and aerospace, the authors conclude that China’s leading firms face critical challenges, even in the sector that has achieved significant successes.

The Global Business Revolution

China’s attempt to build large globally competitive firms coincided with the most revolutionary epoch in world business history, possibly even including the Industrial Revolution. The global business revolution presents a fundamental challenge for China’s large firms.

Keywords: Global business revolution, Large firms, China

General Features of the Global Business Revolution

Liberalization of World Trade and Capital Markets

The period since the late 1980s has witnessed for the first time the opening up of a truly global marketplace in goods, services, capital and skilled labour. The only market which still remains bound firmly by nationality is the vast sea of unskilled labour. The world’s leading firms have massively increased their
production capabilities in fast-growing parts of developing countries. Foreign direct investment (FDI) in developing countries grew from $24 billion in 1990 to $170 billion in 1998. China was, by far, the main focus of attention, with FDI rising from $3.5 billion in 1990 to $44 billion in 1998 (World Bank, 2001, p. 315). The struggle among the world’s leading firms has now deeply penetrated the most developed parts of the low and middle income countries. China is at the centre of this battle.

Explosive M&A and Concentration

The period since the 1980s has witnessed the world’s most explosive period of mergers and acquisitions. Global M&A rose from $156 billion in 1992 to around $3,300 billion in 1999 (Nolan, 2001b, p. 38). The size of the merger boom of the 1990s eclipses that of any previous epoch. It will leave a long-lasting imprint on the global business structure. In sectors as diverse as large civilian aircraft, automobiles, chemicals, pharmaceuticals, power equipment, packaging, computer systems, lifts, mobile phones, camera films, magazine paper, advertising, tobacco, ice cream, and soft drinks, a small number of focused global producers dominate the market (Nolan et al., 2002, pp. 95–100). Competitive capitalism’s inbuilt tendency to concentration and oligopoly has finally flowered on a global scale.

‘Cascade Effect’

Not only have the core ‘systems integrators’ experienced an explosive process of concentration. The deepening interaction between core companies and supplier companies has created an explosive ‘cascade’ effect that is rapidly leading to concentration and focus among the first tier suppliers and spilling over into second and third tier suppliers. In sector after sector, the ‘first tier’ suppliers are themselves multibillion dollar companies with ‘global reach’. For example, concentration among leading aircraft assemblers has stimulated concentration among the main aerospace components suppliers: just three makers of large aircraft engines across the world. Concentration among automobile assemblers has stimulated concentration among automobile components makers: just three tyre makers account for 51 per cent of global tyre sales; just three ABS brake systems producers account for 72 per cent of global sales and just two firms account for 73 per cent of the diesel fuel injection pumps. Concentration among IT equipment makers has stimulated concentration among IT suppliers. Just one firm accounts for 85 per cent of global sales of micro-processors, another accounts for 80 per cent of high end routers, another supplies around one half of all optical fibres and another accounts for over nine-tenths of computer operating systems (Nolan et al., 2002, pp. 95–100).

This makes the competitive landscape even more challenging for firms from developing countries.

The ‘External Firm’

Through the hugely increased planning function undertaken by systems integrators, facilitated by recent developments in information technology, the boundaries of the large corporation have become blurred. Competitive advantage for the systems integrator requires that it must consider the interests of the whole value chain in order to minimize costs across the whole system. Far from becoming ‘hollowed out’ and much smaller in scope, the large firms, facilitated by advances in IT, enormously increased the extent of control during the global business revolution (Nolan, 1999). Indeed, one can speak of a new form of ‘separation of ownership and control’. Firms that wish to be selected as ‘aligned’ or ‘partner’ suppliers to the leading system integrators, must agree to co-operate with the core firms within the sector in opening their books, planning their new plants, organising their R&D, planning their production schedules and delivering their products to the core firms. This is a new form of industrial planning that extends across the boundaries of formal ownership structures and radically undermines old ideas of the size and nature of the firm.

Dominance of Firms Based in Advanced Economies

Firms headquartered in regions containing a small fraction of the world’s population have comprehensively dominated the global business revolution (Nolan, 2001a, p. 47 and Tables 2–7). The high-income economies contain just 16 per cent of the world’s total population. They account for 91 per cent of the world’s total stock market capitalization, 95 per cent of Fortune 500 companies, 97 per cent of the FT 500 companies, 99 per cent of the world’s top brands and 100 per cent of the world’s top 300 companies by value of R&D spending. North America is by far, the world leader in this process. Developing countries are massively disadvantaged in the race to compete on the global level playing field of international big business. The starting points in the race to dominate global markets could not be more uneven. The whole of the developing world, containing 84 per cent of the world’s population, contains just 26 Fortune 500 companies, 16 FT 500 companies, 15 of Morgan Stanley’s list of the 250 leading ‘competitive edge’ companies, one of the world’s top 100 brands and none of the world’s top 300 companies by R&D expenditure.
Paradox of the Big Business Revolution

The blunt reality of the global business revolution is that the period witnessed an unprecedented increase in the intensity of oligopolistic competition between giant firms, alongside an increase in the extent of concentration within each sector and sub-sector. This period saw unprecedented concentrations of expenditure by giant firms on technical progress through R&D spending, global procurement, marketing, human resource development and on spreading best practice techniques across the whole value chain. In sector after sector, the period witnessed the paradox of falling prices and improved product quality to meet consumer needs alongside the intense growth of oligopoly.

The Reform of China's large firms

Ambitions

Since China began liberalizing the post-Mao economy in the late 1970s, a consistently stated goal of China's industrial policy has been to construct globally powerful companies that can compete on the global level playing field. ‘Our nation’s position in the international economic order will be to a large extent determined by the position of our nation’s large enterprises and groups’ (Wu Bangguo, Vice Premier, August 1998).

China’s approach to reforming its large State-owned enterprises was heavily influenced by the analysis of industrial policy elsewhere. A succession of ‘late comer countries’ developed powerful indigenous firms through different measures of industrial policy, including Britain during the Industrial Revolution, the United States and Continental Europe in the nineteenth century, the Republic of Korea, Singapore and Taiwan in the second half of the twentieth century. The path taken by China was radically different from that followed in other planned economies, which abandoned industrial policy and attempted to achieve sweeping privatization of the large-scale State sector, and allow the market to decide the outcome'.

A group of large industrial enterprises was chosen as China’s ‘national team’: AVIC in the aerospace industry; Sinopec (China National Petrochemical Corporation) and CNPC (China National Petroleum and gas Corporation) in oil and petrochemicals; Sanjui, Dongbei, and Shandong Xinhua in pharmaceuticals; Harbin, Shanghai, and Dongfang in power equipment; Yiqi, Erqi, and Shanghai in automobiles; Shougang, Angang, and Baogang in steel; and Datong, Yanzhou and Shenhua in coal mining, China Mobile and China Unicom. These chosen global large corporations were supported through industrial policies, which included: tariffs, which still were significan in many sectors at the end of the 1990s; non-tariff barriers, including limitations on access to domestic marketing channels, requirements for technology transfer and to sub-contract to selected domestic firms as the price for market access; government procurement policy; government selection of the partners for major international joint ventures; preferential loans from State banks; and privileged access to listings on international stock markets.

On the eve of China’s entry to the WTO, the country’s commitment to building globally competitive large firms remains undiminished: ‘The country will develop thirty to fifty large State-owned enterprises in the next five years through public offerings, mergers and acquisitions, restructuring and co-operation’ (Bai Rongchun, Director General, Industrial Planning Department, State Economic and Trade Commission, July 2001).

Despite the strength of such statements, behind the scenes there is an intense struggle over China’s industrial policy. Within China, there are strong views that emphasize the contribution of small and medium-sized firms to economic development, and underplay the extent of global concentration and the challenge it poses to Chinese firms. They emphasize the importance of ‘competition’ defined in terms of the number of firms in a given sector within China, rather than the intensity of global competition among oligopolistic giant firms.

Difficulties

In the course of two decades, China’s large enterprises have advanced their business capabilities, undertaking evolutionary institutional changes in key aspects of their business organization (Nolan and Wang, 1998). China’s large State-owned enterprises have grown rapidly in terms of value of sales; absorbed a great deal of modern technology; learned how to compete in the marketplace; substantially upgraded the technical level of their employees; learned wide-ranging new managerial skills; gained substantial understanding of international financial markets and become sought-after partners for multinational companies. Throughout most of the 1990s, China was the largest recipient of FDI after the United States, regularly accounting for around 10–12 per cent of total world FDI and around one-third of total flows of FDI into developing countries (UNCTAD, 1999). Increasingly, global corporations viewed China as a central element in their long-term strategy.

Alongside these significant successes, China encountered many difficulties during this long evolutionary process.
GLOBALIZATION CHALLENGE

Policy Inconsistency
As we shall see, within the same industry, radically different reform policies were pursued at different times. For example, in oil and petrochemicals, for many years, the policy was to increase the autonomy of large production units. Then policy shifted totally towards centralized control over large production units. At the same time, completely different policies were pursued in different sectors. For example, while control was being centralized in the oil and petrochemical industry, Aviation Industries of China was, incomprehensibly, being broken up into two separate entities, each of which was even less able than before to compete with the global giants.

Where is the Firm?
The foundation of China’s economic reform was to increase ‘enterprise’ autonomy. The core of most large ‘enterprises’ was a single large production unit. This had many benefits, including the development of a strong sense of corporate ambition at the enterprise level. However, it caused difficulties in the subsequent attempts to build multi-plant firms with unified central control over individual production units.

Impoverished Economy
China is still a poor country, with a relatively tiny middle class. For example, the entire stock of saloon cars is only around five million. A large fraction of domestic demand is for low price, low value-added products for over one billion peasants, internal migrants and poor urban residents. Indigenous firms have to fight a battle on two fronts, on the one hand with global giants in high value-added products, and on the other hand, with domestic SMEs in low value-added products.

Local Protectionism
China has a strong tradition of relatively autonomous local government. There has been persistent local resistance to cross-regional mergers, due to fears of downsizing and/or loss of control of a ‘local asset’.

Inheritance from the Planned Economy
Unlike the other ‘late-comer’ countries, China’s large enterprises inherited huge manning levels, which are extremely hard to reduce without causing social instability. This will remain a deep problem for many years.

Incentive to Diversify
The inability of China’s emerging large firms to compete on international markets, plus the fact that they each have a huge workforce, produced a high incentive for the individual enterprise to diversify. A single large enterprise could easily have hundreds of ‘children’ and ‘grandchildren’ subsidiaries and related companies. This gives the ‘illusion of scale’, but beneath an apparently large firm there are typically hundreds of uneconomically small firms and immense problems of corporate governance.

Problems for China’s Bureaucracy
China’s bureaucracy lacked the intense nationalist incentive to build large firms successfully unlike Japanese (and the Republic of Korea) policy makers. Also, China’s leaders are engaged in an intense drive to root out corruption from the country’s huge bureaucracy. Corruption undermines the bureaucracy’s ability to lead industrial policy effectively.

Ideological Commitment to State Ownership
China remained for most of the reform period committed to State ownership as a goal in its own right, rather than building powerful corporations by whatever means was suitable. It proved hard to achieve the separation of government and enterprise that has been advocated for many years.

The Challenge for China
Case studies conducted in the late 1990s in a wide range of sectors (Nolan, 2001a) show that after two decades of reform in most sectors the competitive capability of China’s large firms is still weak in relation to the global giants. By the simplest of measures of sales revenue, profits and R&D, China’s vanguard of leading firms that are intended to ‘compete on the global level playing field’, are still significantly behind the global leaders. This was found to be extremely marked in the high-technology sectors, such as IT hardware, complex equipment such as power plants, and pharmaceuticals, as well as in ‘mid-technology’ sectors such as automobile assembly and automobile components. However, even in sectors with apparently less advanced technology, such as steel and coal, there was a significant gap with leading global companies in the high value-added segments of the market. In financial services, it is widely recognized that China’s leading commercial banks, insurance companies and accountancy firms lag far behind the global leaders.

At the start of the 21st century, not one of China’s leading enterprises has become a globally competitive giant corporation, with a global market, a global brand, and a global procurement system. The Chinese companies included in the Fortune 500 all faced huge problems of downsizing. China had no fewer than five of the top ten companies in the Fortune 500 in terms of numbers of employees (Fortune Global 500, 2001). China had just two companies in the FT 500 which ranks firms by market capitalization (Financial Times 11 May 2001). These were China Mobile and China Unicom, both of which operate in a totally protected domestic environment. The vast bulk of their IT hardware equipment was purchased from the global giants. China did not have one company in the world’s top 300 companies by R&D expenditure (Department of Trade and Industry, 2000). China did not have any representatives in Morgan Stanley Dean Witter’s list of the world’s top 250 ‘competitive edge’ companies (Morgan Stanley Dean Witter, 2000).
China did not have a single company in Business Week’s list of the world’s top 100 brands (Business Week, 6 August 2001).

China’s rapid move towards ‘close’ integration with the world economy is occurring at a time of revolutionary change in the global business system. This presents an extreme challenge for China’s industrial strategy. The analysis of two different industries in the second and third sections — oil and petrochemical, aerospace — is intended to investigate the nature of the challenge facing large Chinese firms in ‘strategic’ sectors that have formed, and still do form, an important focus of industrial policy in high-income countries.

Oil and Petrochemicals

The Global Setting

Crude oil and natural gas remain central to the global political economy. However, the regional distribution of world oil and gas reserves, production and consumption is highly uneven. This is of special importance for the global political economy. At the end of the 1990s, among the world’s top 25 oil companies ranked by operating performance, 14 (15 if Petrobras is included) were State-owned national oil companies (NOCs), all based in developing countries (Petroleum Intelligence Weekly, 18 December, 2000). These NOCs own the majority of the world’s oil and gas reserves and are the world’s largest oil producers. However, they are relatively weak in downstream refining and marketing. There have been no cross-border mergers among the NOCs. China is poorly endowed with oil and gas. Its share of the world’s oil and gas reserves amount to only 2.3 and 0.9 per cent respectively (BP, 2001). In 2000, China was the third largest oil consuming country after the United States and Japan. After 1993, China became a net crude oil importer. Oil imports in 2000 were equivalent to 31 per cent of China’s total oil consumption.

Mergers and Acquisitions

In the late 1990s, a frenzy of consolidation began to sweep through the global oil majors. This fundamentally changed the competitive landscape in the industry. The mergers and acquisitions included BP’s trans-Atlantic merger with Amoco and its take-over of Atlantic Richfield Company (Arco), securing BP’s position as one of the top ‘big three’ western oil companies; Exxon’s merger with Mobil, the new company created overtaking Royal Dutch/Shell as the largest western oil company; the merger between TotalFina, created through French Total’s take-over of the Belgian PetroFina, and Elf Aquitaine; the merger between Chevron and Texaco. The consolidation process has been ‘cascading’ into the mid-sized integrated oil and petrochemical companies. The merger between Conoco and Phillips in 2001 created the world’s sixth largest energy company in terms of reserves and production.

Repsol-YPF

During the period of large-scale mergers among the western major oil companies, Spain’s Repsol launched a hostile bid for Argentina’s YPF in 1999. YPF, Argentina’s ‘national champion’, was privatized, restructured, and subsequently listed in the stock exchanges in Buenos Aires and New York in 1993. It was then the largest publicly traded oil company in Latin America. The deal is highly significant in that it is the first time that a large privatized western oil company has taken over a major, formerly State-owned oil and petrochemical company from a developing country.

Competitive Obstacles for Firms Based in Developing Countries

The mergers in the world’s oil and petrochemical industry during the global business revolution have created a group of new super-giants that stand in a position of greatly enhanced competitive advantage compared to potential competitors from developing countries. These new super-giants greatly increased their size and their assets base. They have constructed a portfolio of high quality oil and gas reserves distributed around the world. They are able to invest large amounts in R&D to sustain and extend their technical lead over other companies. They have the resources to invest in large-scale information technology systems that can better integrate their extended internal value chain, stretching from exploration to the petrol station. They have developed marketing systems with immensely powerful global brands. They have built massive multi-billion dollar central procurement capabilities with large consequent cost-savings. MSDW estimates that the super-majors, namely Exxon Mobil, Shell and BP, have a capability to sustain their competitive edge in the industry for at least fifteen years (Morgan Stanley Dean Witter, 1998). Not one integrated oil and petrochemical firm based in a developing country has been able to challenge the global giants in this sector. By far the most successful example was YPF. However, as that case vividly illustrated, privatization, liberalization and high quality management, are far from a guarantee of independent survival.

China’s Response

In the same period that the merger frenzy swept through the global major oil companies, China’s oil and petrochemical industry underwent massive restructuring. After an intense debate on how to reform the oil and petrochemical industry, the Chi-
The Year 2000 Flotation of PetroChina and Sinopec

In April 2000, PetroChina, created from the core businesses of CNPC, listed on the New York and Hong Kong (China) Stock Exchanges. The parent company CNPC held a 90 per cent of PetroChina’s total equity. BP became PetroChina’s strategic investor. In October 2000, Sinopec, established from the core businesses of the oil Sinopec (now known as Sinopec Group) listed on the stock exchanges of New York, Hong Kong and London. Sinopec Group controlled 56 per cent of Sinopec’s equity. Exxon Mobile, BP, Shell and ABB Lummus became Sinopec’s strategic investors. Equity involvement by the global supermajors was crucial to their successful listing of PetroChina and Sinopec.

Business Capabilities

Reserves and Output

PetroChina’s oil reserves and production were close to the level of the world’s leading companies. Sinopec is similar to Repsol YPF in terms of oil reserves and oil production. In terms of gas, even the combined production volume of PetroChina and Sinopec lags considerably behind the global giants (Table 1). However, the two leading Chinese oil companies are crucially different from the global giants in terms of global distribution and the quality of the portfolio of oil and gas assets. PetroChina and Sinopec produce entirely within China. Daqing, from which 50 per cent of PetroChina’s oil reserves arise, is declining seriously. About one-third of PetroChina’s gas reserves are in the Tarim Basin in Xinjiang. It will require advanced technology and involve high transportation costs to produce and transport the gas from Tarim to the main consuming areas in the eastern part of the country (xi qi dong shu). Less than five of PetroChina’s oil fields can make a profit when the oil price is at $10–15 per barrel, at which the global giants can still make a profit.

Refining

China’s refining sector needs revamping, upgrading and expanding. PetroChina and Sinopec between them only have four refineries with capacities greater than 10 million tons. With more than half of the oil imports from the Middle East, most of China’s refineries need to add capabilities to process sour crude oil. In addition, more stringent environmental regulations for refined products call for high-conversion refineries. With China’s accession to WTO, tariffs on refined products will be reduced from 6 to 12 per cent to a uniform rate of 6 per cent. Few of PetroChina’s refineries can survive in near-open competition with imported refined products.

Marketing Petroleum Products

Only around one quarter of the service stations owned by each of PetroChina and Sinopec (Table 1) was franchised through retail outlets bearing the companies’ brands, ‘PetroChina’ and ‘Sinopec’ respectively. Neither refined product supplies or the price of refined products are centrally controlled, nor are accounts centrally consolidated, even for the network of service stations owned and operated by the two companies themselves. The two companies’ wholesale entities have no effective co-ordination of supply, price or customers. PetroChina and Sinopec still have a long way to go before they develop the logistics expertise of the global giants or possess a comparable brand based on the safe and low-cost operation of a huge logistics system. This is a crucial part of the development of the brand for a globally competitive oil and petrochemical company.

Petrochemicals

Ethylene Crackers

Of the total of 18 ethylene crackers in China, only seven have an annual capacity above 400,000 tonnes. The average annual capacity of each petrochemical site of Sinopec is 400,000 tonnes, only half of that of the global majors. Instead of having a small number of giant, low-cost integrated sites situated in a few concentrated areas, as the global giants do, these 18 ethylene crackers are located at 16 sites in 15 cities.

Product Mix

High-value added production only accounts for 30 per cent of China’s total petrochemical production. The total petrochemical output and low-value added products have not kept up with the rapid growth of China’s economy, which has led to imports of petrochemicals up to 50 per cent of the Chinese market (Sinopec, 2001). With further reductions in import tariffs after China’s accession to WTO, even these low-value added petrochemical products will face intense competition not only from global majors but also from low-cost producers in the Middle East and South East Asia.

Technology

The technological capabilities of PetroChina and Sinopec both upstream and downstream are relatively backward. China’s industry expert pointed out that the country’s low level of technological innovation upstream would pose ‘a great constraint on the industry’s competitiveness and efficiency’ (China Petroleum, January 1999). In petrochemical production, backward technology resulted in a high level of energy consumption and a low percentage of chemicals for further processing and utilization (Chen Huai et al., 1998, p. 29). In terms of R&D spending, the global majors are able to spend more in absolute terms due to the sheer size of their sales revenue. Moreover, they are able to purchase greater amounts of the R&D ‘embedded’ in the products of specialist suppliers to the oil and petrochemical industry\textsuperscript{5}.

nese government created two large integrated oil companies through administrative measures.

GLOBALIZATION CHALLENGE
Table 1  Operating Data Compared: Global Majors vs PetroChina and Sinopec, 2000

<table>
<thead>
<tr>
<th>Company</th>
<th>Reserves</th>
<th>Production</th>
<th>Refinery throughput (mmb/d)</th>
<th>Oil product sales (mmt/yr)</th>
<th>Chemical production (mmt)</th>
<th>Service station number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Oil (bb)</td>
<td>Gas (bcf)</td>
<td>Oil (mmboe/d)</td>
<td>Gas (bcf/d)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exxon Mobil</td>
<td>11.56</td>
<td>55,866</td>
<td>2.55</td>
<td>10.34</td>
<td>5.64</td>
<td>400</td>
</tr>
<tr>
<td>Royal Dutch/Shell</td>
<td>8.67</td>
<td>50,842</td>
<td>2.27</td>
<td>8.22</td>
<td>2.92</td>
<td>278.5</td>
</tr>
<tr>
<td>BP</td>
<td>6.51</td>
<td>41,100</td>
<td>1.93</td>
<td>7.61</td>
<td>2.92</td>
<td>188</td>
</tr>
<tr>
<td>TotalFinaElf</td>
<td>6.96</td>
<td>20,705</td>
<td>1.43</td>
<td>3.76</td>
<td>2.41</td>
<td>185</td>
</tr>
<tr>
<td>Chevron Texaco b</td>
<td>6.83</td>
<td>19,176</td>
<td>2.30</td>
<td>3.70</td>
<td>2.26</td>
<td>233.5</td>
</tr>
<tr>
<td>ENI</td>
<td>3.42</td>
<td>14,762</td>
<td>0.80</td>
<td>2.50</td>
<td>0.86</td>
<td>53.5</td>
</tr>
<tr>
<td>Repsol YPF</td>
<td>2.38</td>
<td>14,394</td>
<td>0.64</td>
<td>2.22</td>
<td>1.21</td>
<td>51.4</td>
</tr>
<tr>
<td>PetroChina</td>
<td>11.00</td>
<td>32,532</td>
<td>2.10</td>
<td>1.38</td>
<td>1.50</td>
<td>56.4</td>
</tr>
<tr>
<td>Sinopec Corp.</td>
<td>2.95</td>
<td>999</td>
<td>0.68</td>
<td>0.22</td>
<td>2.12</td>
<td>67.0</td>
</tr>
</tbody>
</table>

Sources: compiled from company reports

*bb = billion barrels, bcf = billion cubic metres, mmboe/d = million barrels of oil equivalent per day, bcf/d = billion cubic feet per day, mmb/d = million barrels per day, mmt/y = million barrels per year, mmt = million tonnes
bFigures are combined estimates after announced merger in October 2000
cCapacity
dNumbers include 8000 service stations of Caltex
Financial Performance

Revenue
Their sales revenue place PetroChina and Sinopec alongside the leading second tier of global oil and petrochemical companies, but far short of the industry leaders, Exxon Mobil, Shell and BP.

Profit
In the year 2000 net profits at PetroChina and Sinopec were $6.67 billion and $2.30 billion, respectively, one-third and one-half that of the top ‘big three’ western oil companies. The year 2000 may not provide a good guide to the two companies net profits in the medium-term due to the rise in crude and refined oil prices. However, profits per worker at PetroChina and Sinopec are minuscule compared to those at the global oil giants.

Market Capitalization
If one assumed that the whole company was floated, then at the share price as of 4 January 2001, the market capitalization of PetroChina and Sinopec would be $35 billion and $14 billion respectively, only a fraction of the $286 billion for Exxon Mobil, $206 billion for Royal Dutch/Shell and $178 billion for BP. Industry experts have voiced serious concerns about PetroChina’s level of operational efficiency and about the high level of uncertainty in its performance after China’s accession to the WTO.

Organizational Structure
The organizational structure of PetroChina and Sinopec is superficially similar to that of an international integrated oil company. The superficial similarity conceals important differences. The global giants have a strong ‘one company’ corporate identity and culture. Within PetroChina and Sinopec there exist powerful entities that over the years developed strong independent corporate identities and ambitions. Both PetroChina and Sinopec are integrating these powerful subordinate companies by centralising control over planning, personnel, investment and finance. Nevertheless, establishing a unified corporate identity and culture remains a formidable challenge.

The relationship between the two listed companies and their parent companies remains ambiguous. A principal part of the annual income of CNPC and Sinopec Group is from the dividend payment of the two listed companies. In 2000, CNPC received an approximate $3.1 billion dividend payment from PetroChina, accounting for 53 per cent of its net profit. The non-core businesses of CNPC and Sinopec Group employ more than 800,000 people and 600,000, respectively. A large fraction of these activities are loss-making. To what extent PetroChina and Sinopec have autonomy in making decisions with respect to business strategy, dividend payments and appointment of senior management remains unclear. Such a structure has caused concern to be expressed about the respective companies’ commitment to creating shareholder value and protecting the rights of minority shareholders.

The Competitive Landscape
The global giants are deeply interested to develop their business in China from upstream to downstream. According to the State Economic and Trade Commission, in upstream exploration and development, by 1999, total foreign investment reached $1.1 billion in onshore upstream and $6.45 billion in offshore upstream. In petrochemicals, global petrochemical giants will set up six joint venture petrochemical complexes by 2005, each of the projects involves $2.5–4.5 billion investment and locates in the coastal regions, which have the highest average income level in China. If we assume all the joint venture projects start production in 2005, they would account for 42 per cent of total projected ethylene demand in China at 10 million tons (Oil and Gas Journal, 10 January 2000). The global giants are in most areas technologically far ahead of their Chinese counterparts in these joint ventures. From the perspective of the foreign partner in the joint venture, they each form a part of the respective global business system, typically a single business unit. In this sense, they represent an important growth of the multinational giants within the indigenous Chinese firm.

As discussed above, the global majors have become strategic investors in PetroChina and Sinopec. In April 2001, PetroChina and BP established a marketing joint venture in Guangdong, aiming for 500 service stations by 2001. Each of the global majors, Exxon Mobil, Shell and BP, are setting up joint ventures with Sinopec for 500 service stations in Guangdong, Jiangsu and Zhejiang, respectively. For the three companies, this was ‘but the beginning of their attempts to capture a share of the world’s largest retail market’ (Petroleum Economist, October 2000). The strategy of the global giants to expand their downstream, high-margin business, each in a different part of the China’s high-income coastal markets, is clear.

Summary
The process of restructuring and flotation of PetroChina and Sinopec was achieved through administrative measures within just one year. Despite this achievement, substantial question marks remain. Across the whole value chain from upstream to downstream, PetroChina and Sinopec are at a disadvantage in terms of the quantity of oil and gas reserves compared with the national oil companies, and in terms of global distribution and quality of...
reserves compared with the super-majors. They are at a disadvantage in technology and financial strength compared with the global majors. There remains a deep internal battle to establish a cohesive corporate culture to integrate their powerful subordinate companies and establish a truly unified company. The relationship of the floated companies with the parent remains unresolved. Across the value chain, PetroChina and Sinopec have been actively forming ‘strategic alliances’ and establishing joint ventures with global oil and petrochemical companies. On the verge of China’s entry to the WTO, a meeting convened by the State Planning and Development Commission reported China’s petrochemical industry ‘faces severe challenges’ (Xinhuanet, 2001). It remains an open question whether PetroChina and Sinopec will succeed where YPF failed.

Aerospace

Global Trends

Consolidation

The dramatic change in the demand side of the world’s aerospace industry in the 1990s has been a powerful force to drive forward consolidation. After the Cold War, both the USA and Europe drastically reduced their defence spending (International Institute for Strategic Studies, 1999, p. 37). Procurement techniques rapidly moved towards those of the civil aerospace world as governments pushed contractors to lower costs. Alongside the decline in defence procurement, European and US military aircraft manufacturers have been able to sell to markets that were inaccessible during the Cold War (International Institute for Strategic Studies, 1999, p. 283).

Since the 1980s, privatization as well as international alliances among the world’s airlines placed great pressure on aircraft suppliers to reduce cost. One major effect of the events of 11 September 2001 may well lead to large-scale global consolidation in the world airline industry, mimicking that among the equipment makers. Moreover, it is likely that a decline in commercial aircraft purchase will be partially compensated for by increased purchase of military aircraft and other military equipment.

USA

Initiated by the Pentagon, over $62 billion-worth of mergers and acquisitions occurred between 1994 and 1998 in the USA (Financial Times, 3 September 1998). The most significant event in this process was the merger between Boeing and McDonnell-Douglas. The resulting extraordinarily high level of industrial concentration received ‘strong support from the USA administration’ (Financial Times, 23 September 1997). The merger resulted in Boeing being the only producer of jet airliners in the USA and accounting for no less than 84 per cent of the world’s total commercial aircraft in service (Financial Times, 23 September 1997). After the merger, Boeing and Lockheed Martin completely dominated military aircraft sales to the US government (Financial Times, 3 September 1998). On 26 October 2001, the Pentagon awarded the $200 billion Joint Strike Fighter (JSF) programme, the biggest defence procurement, to Lockheed Martin. The procurement decision ‘catapults Lockheed into an unassailable position as the world’s top builder of fighter aircraft’ (Financial Times, 29 October 2001).

Europe

The European military aerospace industry with much smaller and fragmented government procurement than their counterparts in the USA realized that it must unify or perish before the US challenge. In October 1999, Dasa of Germany and Aerospatiale-Matra of France and Spain merged into a new giant company called the European Aircraft, Defence and Space Company (EADS). However, EADS now has serious problems with its management structure leadership (Financial Times, 16 November 2001). Moreover, BAe Systems, EADS’s partner in Airbus, Eurofighter, now is a full partner with Lockheed Martin in the JSF programme. France is committed to its own Rafale fighter through Dassault and competes for export orders with EADS’s Eurofighter. Italy has decided to quit the European programme to build a large military transport aircraft A400M. In addition, the events of 11 September will put severe pressure on Airbus, especially given the large outlays already undertaken on the super-large aircraft A380, for which the market now looks much less optimistic. In sum, the final shape of the European aerospace industry is far from certain.

Transatlantic Option

The USA has the world’s largest arms market by far. In an effort to prevent the emergence of a ‘Fortress Europe’ in the arms industry, the US government has been moving towards relaxing its controls on foreign investment in the industry and greater technology sharing with European-based defence firms. Jacques Gansler (Head of Procurement, Pentagon) announced that the Pentagon was willing to allow European or Asian companies to ‘buy major US defence companies under certain conditions’, one of which was that other countries must reciprocate, allowing similar access to their own markets (International Herald Tribune, 8 July 1999). If realized, such mergers would radically change the nature of the Euro – US defence industry relationship and have a strong impact on the cause of European Aerospace integration.

Systems Integration

Integrating the Supply Chain

Modern aircraft and engines have become so complex that a major aspect of competitive advantage has become the ability to integrate the whole system of supply to produce the final product. The system integrators — the designer and assembler of the civilian aircraft or the prime contractors for defence industry
contracts — make large investments in IT systems to integrate the supplier networks tightly with the core design and assembly location, and involves increasingly detailed, instantaneous exchange of information. The surrounding system of suppliers today constitutes a veritable ‘external firm’, whose activities are closely co-ordinated and planned by the core systems integrators. For example, Airbus has more than 1500 suppliers in 27 countries, including over 500 US companies, and suppliers in Singapore, India, Australia, Indonesia, Korea, Japan and China. The size of the ‘external firm’ can greatly exceed that of the core companies. Rolls-Royce has around 20,000 people in its aerospace division in the UK, and estimates that around 40,000 people work full-time to supply the company with goods and services.

Building Internal Systems Integration Capabilities
Alongside the trend towards concentration among component and sub-system suppliers, the leading systems integrators are themselves tending to become more vertically integrated. This enables them to perform the increasingly complicated tasks involved in integrating complex sub-systems with multiple interfaces (Morgan Stanley Dean Witter, 1999, p. 85). For example, Raytheon bought a succession of military businesses in the 1990s, including the military electronics company, E-Systems, the military systems and electronics business of Texas instruments, and the Hughes military electronics business from General Motors. By the late 1990s, Raytheon had become a huge company with a $20 billion annual turnover, and a wide range of systems integration capabilities in missiles and torpedoes.

The ‘Cascade’ Effect
In order to meet the demands of the systems integrators, the major components suppliers themselves needed to invest heavily in R&D and to grow in order to benefit from cost reduction through economies of scale. A powerful merger movement is taking place among first tier suppliers to the systems integrators. In the crucial aircraft engine sector, there are now only three engine makers left that have the capability to produce large modern jet aircraft engines, namely Rolls-Royce, Pratt and Whitney of United Technology and GE Engine of GE. In 1997, the market share of civil aero-engine orders in terms of value between them was 34 per cent for Rolls-Royce, 55 per cent for GE and 13 per cent for Pratt and Whitney (Financial Times, 6 March 1998). The Allied Signal/Honeywell merger in 1999 created a company that has ‘a strong position in everything from manufacturing cockpit controls to handling aircraft service and maintenance’ (Financial Times, 8 June 1999). The trend towards concentration is also affecting smaller companies within the industry as exemplified in Meggitt’s take-over of Whittaker Corporation. The new company supplies valves, ground fuelling products and fire and smoke detectors to ‘virtually every aircraft maker in the West’ (Financial Times, 10 June 1999). The merger was explicitly driven by the assemblers’ push to reduce the number of parts suppliers.

Embraer
Alone among developing countries, Brazil may be on the verge of building a successful national aerospace industry, though it is still too early to record a final verdict on the endeavour. Embraer (Empresa Brasileira de Aeronautica) was a Brazilian ‘national champion. It was privatized in 1994 and listed in the New York Stock Exchange in 2000.

Embraer has grown rapidly from a small regional manufacturer into a significant global player in regional jets. In 1999, the company delivered 97 regional jets, compared to 82 from Bombardier, its main rival; 23 from BAe and 15 from Fairchild Dornier (HBS, 2000).

Competitive Obstacles for Firms Based in Developing Countries
The aerospace industry is a capital-intensive high-technology industry with high barriers to entry. The profound transformation of the leading aerospace companies based in the US and Europe in the 1990s created even higher barriers to entry than existed before. Today, major aerospace companies in developing countries face greater obstacles than ever in their attempt to catch up with the world leaders. Aerospace companies based in Europe and the US benefit from vast military procurement, which together account for around 60 per cent of the world’s total military procurement. They have massive economies of scale in assembly with long production runs for each aircraft type. They have huge R&D spending and large R&D support from their respective government (Fransman, 1995, p. 107), especially in the US, which has enabled them to sustain their technological lead: ‘The development of the US aerospace industry was largely government-funded. As late as 1986, close to 80 per cent of all R&D in this industry was Federally-supported’ (White House, 2000). They have huge financial strength and resources reflected in large market capitalizations, access to export credit guarantees supported by the government and often have the benefit of co-finance of industrial development with the government. They have high capabilities in system integration in both the internal and external firms on a global scale. They have established globally recognized brands both for aircraft and for key sub-systems.

Not one firm from a developing country has succeeded in challenging the aerospace giants of the developed countries either as a systems integrator or a major first tier supplier. Embraer represents the highest achievements so far for developing countries in the field of commercial aerospace. However, it is far from certain that in the foreseeable future it will be able to compete successfully with the established giants in even the regional jet market, let alone in the market for larger aircraft.
China’s Response

The restructuring of China’s aerospace industry started at the same time that the world’s leading aerospace companies entered a period of profound change. In 1993, Aviation Industries of China (AVIC) was established, assuming responsibility for the management of all the aviation industry assets formerly under the Ministry of Aviation Industry. It was formally turned into an experimental State holding company in 1996. The goal of the holding company was to transform the nation-wide collection of enterprises into an internationally competitive aviation company ‘with world-wide fame and influence’ (Aviation Industries of China, 1998, pp. 2–4).

The Year 1999 Restructuring: Splitting into Two

Debate over how to restructure it in the light of its own internal problems and the explosive changes going on outside in the world industry became increasingly intense by early 1999 when the Chinese government decided to split AVIC into two fully integrated parts, AVIC 1 and AVIC 2. The stated goal of the reform was the ‘break up of monopoly and the fostering of fair market economy mechanism’ (China Daily Business Weekly, 31 January 1999). While the world’s leading aerospace corporations were in the midst of an unprecedented epoch of consolidation, the Chinese aerospace industry was being divided into smaller segments. After the restructuring, the new AVIC 1 took over businesses in manufacturing interceptor, interceptor-bomber, tanker, transporter, trainer, and reconnaissance aircraft while the new AVIC 2 focused on helicopter, transporter, trainer, and general aircraft.

AVIC’s Businesses

Size
In 2000, the combined total sales of AVIC 1 and AVIC 2 were less than one-tenth of Boeing’s and one-fifth of Lockheed Martin’s (Table 2). However, AVIC 1 and AVIC 2 together employs over 400,000 people, more than twice as many as Boeing and Lockheed Martin do. If AVIC’s entire engine division were a separate company, and adopted Rolls-Royce’s manning levels, it would employ only around 1200 people.

Non-aviation Production
In line with the policy of ‘military to civilian conversion’ and the strategy of ‘civilian supports military’, AVIC had been turned into a vast empire of diversified businesses. By 1997, AVIC manufactured more than 5000 types of non-aviation products. In real terms, the sales of non-aerospace products rose by around 25 per cent per annum from 1979 to 1997. Automobiles, auto components and motorcycles together accounted for 62 per cent of the total value of AVIC’s revenue in 1997. Sales revenue of motor vehicles accounted for 72 per cent of the total sales revenue of AVIC 2 (Aviation Industries of China, 2000, p. 9).

Sub-contract/Sub-system Joint Ventures
By 1995, AVIC had signed contracts for a cumulative total of $1.5 billion-worth of sub-contracting work. The principal contracts were with Boeing. AVIC had progressed from purely compensation trade to becoming a competitive global supplier of components, including being the sole suppliers of some items (B-747 wing rear ribs, B-737 maintenance doors, BAE 146 doors, Dash-8 cargo doors and LM2500 turbine disks). Despite their substantial growth, China’s sub-contracts with the global giants are small-scale. In the aero-engine sector, the total output value of the relatively large-scale joint venture between Xian Aero-engine Company and Rolls-Royce to manufacture turbine blades will be only around $30 million at full production in the early 21st century (China Daily Business Weekly, 11 October 1998).

AVIC does not participate in the decisions over aircraft purchase in China. This limits its ability to place leverage on the global aircraft makers to sub-contract within China. Moreover, the main Chinese aircraft manufacturers are competing with each other to obtain sub-contract work, which weakens the overall industry’s bargaining power in obtaining sub-contracts, and in settling the terms for the sub-contracts. In addition, China’s sub-contractors lack ability to co-finance on a large scale. In the meantime, China’s leading sub-contractors face intense international competition from Israel in military sub-contracting, and from Japan and South Korea in civil sub-contracting. China’s sub-contractors are generally only able to contract for ‘Level 3’ contracts, compared to the sub-contract of Japan and South Korea usually at Levels 4 or 5. The latter usually involves co-financing and co-designing.

AVIC’s Structure

Children and Grandchildren
The business structure of AVIC is extremely complex. The function of the headquarters in monitoring, control, co-ordination and unifying the whole company to utilize resources and maximize returns is extremely weak. AVIC has 116 subordinate plants grouped under 56 ‘children’ enterprises. There is a cascade of businesses each with investments in subordinate companies, from ‘children’, through ‘grandchildren’, ‘great grandchildren’, ‘great-great-grandchildren’ and ‘great-great-great-grandchildren’. The result is a typical East Asian diversified conglomerate, investing in any activity that brings some short-term profit, but without a common focus. This structure raises deep problems for corporate governance and central control over the operations of subsidiaries and related companies. After the 1999...
restructuring, both AVIC 1 and AVIC 2 inherited this business structure.

**Flotation of Subsidiaries**

The institutional structure of AVIC has changed gradually since the mid-1990s through the flotation of different parts of the Company. By 1998, seven subsidiaries had floated. The typical flotation is of a minority share in the floated company, with the majority shareholding still held by AVIC through its subsidiary company. For example, in the case of XAC International, XAC held 64.71 per cent of XAC International.

**Flotation of AVIC 2**

At the beginning of 2003, AVIC 2 was awaiting the State Council to approve its international flotation. AVIC 2 undertook restructuring in late 2002 and would merge four of its subsidiaries into a new company for flotation. The proceeds from the international listing would be used to fund businesses such as aircraft and helicopter manufacturing and mini-van production (*China Daily*, 13 January, 2003). If AVIC 2 succeeds in the flotation, it will be the first time for China’s defence industry to get overseas listing.

**Development Setbacks**

In military aircraft, it is likely that there was a real fall in the amount of resources allocated to the modernization of China’s indigenous industry during the economic reform period. The number of military aircraft produced is reported to have fallen significantly (Nolan, 2001a,b). In the mid-1990s, China had ‘a fleet of 5000 obsolete combat aircraft, most of them based on old Soviet designs such as the MiG-21 and MiG-19 fighter aircraft, and the Tu-16 bomber’ (Sergounin and Subbotin, 1999, p. 74).

In civilian aircraft, a total of only 130 Y-7s had been produced by the late 1990s, and new orders had dried up completely. To compound matters, a Y-7 exploded in mid-air in 2000. Following the conclusion of the crash investigation, all 64 Y-7s were taken out of service in June 2001. China’s attempt to build its own indigenous large passenger aircraft, the Y-10, ultimately failed. China’s domestic airlines refused to buy the plane. It was extremely heavy compared to the Boeing 707, with high fuel consumption and a very limited range. After the conclusion of the Y-10 programme in 1985, the Ministry of Aviation devised a ‘three-step take-off plan’, from the MD-90 assembly MD-90 to jointly design and manufacture the AE-100 with Airbus with the ultimate goal of self-designing and building a 180-seater plane by 2010. One by one each of these objectives fell by the way-side. The termination of the MD-90 programme and the AE-100 programme were perceived outside China to ‘deal a severe blow to China’s nascent aviation industry’ and ‘throw into doubt its plans to become a substantial aircraft manufacturer’ (*Financial Times*, 5 August 1998 and 6 October 1998). Many people in the Chinese aircraft industry felt that it had been let down not only by Boeing and Airbus, but also by the Civil Aviation Administration of China (CAAC), which had refused to order either the MD-90 or the planned AE-100.

**Development Plans**

**MA-60 (Xinzhou 60)**

In 2000, AVIC1 launched the MA-60, known as the Xinzhou 60 in China, a 56- to 60-seat turboprop developed from the Y-7-200A. However, the market prospect for MA-60 is poor. First, in the 50–70-seat turboprop market, strong global market positions are already held by the French-Italian ATR 42, Bombardier’s Dash 8, the Swedish Saab 2000 and the Russian-built An-24. Second, the whole future of turbo-

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**Table 2 Relative Size of Selected Aerospace Companies, 1997 and 2000**

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<thead>
<tr>
<th>Company</th>
<th>1997</th>
<th>2000</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assets ($b)</td>
<td>Revenue ($b)</td>
</tr>
<tr>
<td>Boeing</td>
<td>38.0</td>
<td>45.8</td>
</tr>
<tr>
<td>Lockheed Martin</td>
<td>28.4</td>
<td>28.1</td>
</tr>
<tr>
<td>Raytheon</td>
<td>28.1</td>
<td>13.7</td>
</tr>
<tr>
<td>Northrop Grumman</td>
<td>9.7</td>
<td>9.2</td>
</tr>
<tr>
<td>BAE</td>
<td>7.2</td>
<td>10.4</td>
</tr>
<tr>
<td>Rolls-Royce</td>
<td>3.8</td>
<td>6.9</td>
</tr>
<tr>
<td>Vickers*</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>AVIC of which:</td>
<td>7.1</td>
<td>3.1</td>
</tr>
<tr>
<td>aerospace</td>
<td>—</td>
<td>0.7</td>
</tr>
<tr>
<td>AVIC 1</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>AVIC 2</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Vickers was acquired by Rolls-Royce in 1999 for $576 million

*AVIC was split into AVIC 1 and AVIC 2 in 1999

prop feeder planes is in doubt. In the developed countries, competition for small, local feeder aircraft has grown from high-speed trains, a trend that accelerated after 11 September 2001. Moreover, there has been a marked shift in airline preference towards jet-engine feeder aircraft for safety, reliability and customer preference. Third, the history of the Y-7 in terms both of its lack of commercial success and question marks about its safety, makes the task of marketing the MA-60 to commercial airlines, extremely difficult, even within China, let alone internationally.

New Regional Jet Programme
At the end of 2000, it was apparent that China had abandoned the ambition to build a medium-capacity, single-aisle airliner. ‘We cannot compete with aviation giants such as Boeing and Airbus in financial clout and market share’ (Zhang Hongbiao, Vice Minister of the Commission of Science, Technology & Industries of National Defence (COSTIND), quoted in China Daily, 6 November 2000). China’s ‘best bet’ would be producing regional airliners. COSTIND will invest $600-$725 million in R&D for the new regional jet programme aiming to build a new 50–70-seat turbofan aircraft to international standards. AVIC 1 has since formed a programme management company to oversee resources, production, certification and marketing of the new regional jet ARJ21. In the meantime, AVIC 2 devised a three-step plan for developing regional aircraft: establishing a joint venture for final assembly, producing components locally and developing by-products and new products. At the Zhuhai Airshow in November 2002, AVIC 2 announced that the company planned to set up a joint venture with Embraer to produce a 30-50-seat regional plane.

The market prospect for regional jets in China is promising even after the events of 11 September 2001. Boeing has predicted that around 70 per cent of the total of the 1800 new medium and large-sized commercial aircraft purchased by China over the next twenty years will be single-aisle regional jets (Keck, 2001). The competition for selling regional jets to China is intense. Bombardier and Embraer are racing each other for selling to the Chinese airlines. Boeing and Airbus continue to actively market their smallest aircraft to Chinese airlines in an effort to capture the growing regional jet market. Price competition in all aircraft categories can be expected to intensify following the collapse in the world aircraft market after 11 September 2001. This is good news for Chinese airlines, but bad news for a potential regional jet produced in China. If China is, indeed, successful in designing and building its own regional jet, it will be far behind in the race for its own national market by the time that the first deliveries begin. This will be a huge disadvantage in an already intensely competitive segment of the world aircraft market.

Sub-contracting
Following the collapse of the proposed joint production plans for the AE-100 and the MD-90, Airbus and Boeing both responded with offers of considerably enhanced participation by AVIC in the production of sub-systems. Boeing is leading in that strategy with 74 per cent of all parts built in China going to Boeing (Aviation Week & Space Technology, 8 May 2000, p. 63). Airbus agreed that AVIC could participate in the development of its 107-seat A318 programme. These provide the possibility for a significant increase in sales from sub-contracting. However, in the foreseeable future this segment of the industry still seems likely to lag far behind the level of sales and technological sophistication achieved by the sub-contracting industry in Japan and South Korea.

Summary
Since the early 1990s, the world’s leading aerospace companies have achieved massive competitive advantages through high-speed consolidation and through the development of systems integration capabilities, hugely strengthening their already very powerful competitive position. Moreover, this period witnessed the near-disintegration of the former Soviet Union’s civilian aerospace industry and a serious weakening of its military aircraft industry. AVIC has failed to make any inroads on the dominant position of the world’s leading corporations.

Conclusion
The period since the 1980s has seen dramatic changes in the structure of global large corporations. These changes have established the structure within which competition will take place on the ‘global level playing field’ in the early part of the twenty-first century. The period saw an unprecedented concentration of business power. Numerous large ‘national champions’ based in high-income countries have now been merged into even larger cross-border firms, either ‘European champions’5, ‘transatlantic firms’, or, even, European – Japanese or US – Japanese firms. Almost all of these firms remained headquartered within the high-income countries, were owned mainly by shareholders from, and had senior management drawn mainly from, the high income countries.

Globalization has dramatically changed the competitive terrain for which developing countries’ governments must devise their industrial policies. Of all developing countries, China is the one with the greatest possibility to support the growth of globally powerful corporations that might be able to compete in this new environment. It has a potentially huge domestic market and a powerful and relatively effective State through which to implement industrial pol-

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5. The term ‘European champions’ refers to companies that are based in European countries and have achieved significant global market presence and influence. They have often been the result of mergers and acquisitions, leading to a concentration of power and resources within these firms. This concentration has allowed them to compete effectively on a global scale, often challenging established players from other regions.
icy. However, as this paper has shown, even for China, the task has become far harder and more complex than could have been imagined fifteen or twenty years ago when the country began its industrial reforms. The ‘players’ on the playing field occupy far more unequal positions than they did prior to the business revolution. China’s leading firms are in a highly vulnerable position, even in sectors in which China’s policy makers have scored significant successes.

China has just entered the WTO. At this historic juncture, it is crucial that global big businesses and government policy makers in the high-income countries appreciate the severity of the challenges that confront China’s policy makers and business leaders, even in key ‘strategic industries’. Privatization and liberalization are far from sufficient to enable China’s leading firms to compete on the ‘global level playing field’. The ‘global level playing field’ is not an abstract concept. In the end the marketplace involves a competitive struggle between firms, which, together with consumers, are the building blocks of the economic system. For the leading systems integrators and first tier suppliers in each industrial sector, this is a competition between small numbers of identifiable large, often oligopolistic, firms. The struggle is not between the innumerable nameless small firms of textbook perfect competition.

Moreover, large Chinese firms operate in a totally different political-economic environment from that of the world’s leading corporations. China’s political leaders have to consider the huge difficulties that stem from the existence of around one billion poor people within their boundaries, and the complexities involved in the reform of China’s political system. If China’s large firms were to experience widespread defeat, especially in key ‘strategic industries’, in the battle on the global level playing field of the WTO, that would raise deep issues not only for the Chinese government, but also for international relations, and, ultimately, for the large firms headquartered in the high-income countries.

Coping with failure is a massive challenge. Coping with success can also be a challenge.

Notes
1. In fact, as is now widely recognized, it did not prove as easy to privatize the large-scale State-owned sector as was originally visualized.

2. In 1999, total IT hardware sales in China reached $20 billion, including mobile infrastructure and handsets; traditional fixed line and broadband switching equipment; optical cable/optical cable fibre; SD and DWDM products. It is estimated that 90 per cent of the IT hardware by value was supplied by the global giants (including Nokia, Motorola, Ericsson, Cisco, Siemens, Alcatel, and Lucent) either through imports or their large production networks from within China.

3. Petrobras (Brazil) is partially privatized.

4. In January 2003, PetroChina expressed its intention for overseas acquisition to meet the company’s oil and gas production targets at an annual rate of 5 per cent for three years to 2005.

5. For example, Schlumberger spends more on R&D than Shell ($324 million compared with £313 million), while Halliburton spends more than ENI (E160 million compared with £146 million) (DJI, 2000, p. 54).

6. Based on PetroChina’s dividend payment of $0.02 per share and the weighted average number of 171,630 million shares issued and outstanding in 2000.

7. The issues of creating shareholder value and protecting minority shareholders are discussed in China Petroleum, April 2000, pp. 18–29 and an article ‘Oil industry: choices after flotation’ by Zhang Jiwei in Finance (Caijing), November 2000.

8. This term was increasingly used to describe firms such as Alstom, which was formed from the power equipment divisions of Asea (Sweden), Brown Boveri (Switzerland), Alsthom (France), and GEC (UK).

References
Aviation Industries of China (1998), Aviation Industries of China, Beijing.


Department of Trade and Industry (2000), Research and Development Scoreboard, London


Sinopec (2001) Annual Results Presentation, Hong Kong, April.


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