

## **RESTRUCTURING STATE-OWNED BIG BUSINESS IN FORMER PLANNED ECONOMIES: THE CASE OF CHINA'S SHIPBUILDING INDUSTRY**

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Over the course of the last two decades the Chinese shipbuilding industry has been transformed from a low quality producer of basic ships, generally regarded as lacking in technological know-how, into a major force in world shipbuilding. At the start of the 1980s the annual production of China's shipbuilding industry was only 300,000 tons and it was ranked seventeenth in the world in terms of output (Xu 2001). However, since that time China's output has increased more than ten-fold to 3.5 million tons, making China the world's third biggest producer of ships. Between 1990 and 2000, China's share of international commercial shipbuilding increased from 2.5 percent to 7 percent (Hugar 2001). Expectations are that between 2005 and 2010 China will almost triple its existing ship production to a predicted 10 million tons, thus more than doubling its current shipbuilding market share to 15 percent of the world's total (Xinhua 2000).

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China is now also the third largest exporter of ships. By 1999-2000, 70-80 percent of its orders for new ships came from 60 different countries, which gave China almost one-fifth of worldwide export orders for new ships (Xinhua 2000a; Xu 2001). Moreover, over this period, the Chinese shipbuilding industry has not only expanded output, but has successfully traded-up the product cycle into technologically more advanced ships. In addition to traditional bulk carriers and oil tankers it now produces most types of advanced vessels including liquid petroleum gas (LPG) carriers and very large crude carriers (VLCC) for export as well as specialised ships such as roll-on-roll-off vessels and refrigerated containerships. While the Chinese shipbuilding industry still has many problems and its technological level lags the market leaders, Japan and South Korea, China's achievements in terms of growth in output, breakthroughs in technological capabilities and improvement in overall product quality have been remarkable.

At the core of China's shipbuilding industry are China State Shipbuilding Corporation (CSSC) and China Shipbuilding Industry Corporation (CSIC), which are the two large state-owned enterprise (SOE) groups that control the bulk of China's shipyards. There has been a tendency in market-oriented accounts of China's reform experience to regard China's large-scale SOEs and state-owned groups, such as these, as dinosaurs that should be downsized and privatized (McNally and Lee 1998, Shieh 1999). This view, however, has been challenged in a growing literature which argues that the contribution of large-scale SOEs has been critical to explaining China's high rate of economic growth (Nolan 1996, 2001; Nolan and Wang 1999; Nolan and Yeung 2001; Lo 1997, 1999; Smyth 2000). Lo (1999) shows that the share of industrial output of large and medium enterprises, most of which are SOEs, has increased over the reform period and that the financial performance of large and medium size enterprises has been as good, or better, than small-scale industries. Nolan (1996) argues that there has been rapid growth in upstream industries and that through supplying producer goods and establishing substantial linkages this has fuelled growth in downstream industries, which are usually depicted in market-oriented accounts of China's growth record as the engines of growth.

This article contributes to the growing, but still small literature on China's large-scale SOEs. We have two objectives. The first is to examine the transformation of the Chinese shipbuilding industry over the last two decades. The second is to present a detailed case study of "Northern Shipbuilding", which is a CSIC subsidiary, based on interviews conducted in October and November 2002.<sup>4</sup> We use the case study to explore the growth patterns of one large SOE under reform and to examine the ongoing issues confronting reforms to China's shipbuilding industry and large SOEs more generally.

This article differs from existing research on China's shipbuilding industry in two respects. First, extant studies of China's shipbuilding industry have focused mainly on developments in the 1980s (Lu & Tang 2000) or

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<sup>4</sup> Because much of the information provided in the interviews was sensitive, we use the pseudonym Northern Shipbuilding to protect the confidentiality of the firm.

1980s and first half of the 1990s (Moore 2002). This article, though, also considers the effects of more recent developments such as the Asian Crisis and the restructuring of the industry in the late 1990s. Second, existing studies have used a macro-level rather than a firm-level approach to studying China's shipbuilding. As far as we are aware this is the first attempt to supplement the macro-picture of the reform process in the shipbuilding industry with the micro-level insights of an in-depth case study of the changing growth patterns in a single firm.

Foreshadowing our main results from the case study, we find that growth patterns in the firm have been spasmodic. This reflects both decisions taken by the management of the firm, such as to focus on maximising output in the mid-1990s, and external factors, the most notable of which is the Asian Financial Crisis. The experience of Northern Shipbuilding is consistent with other large shipbuilding companies in China in that management has enjoyed a relatively high degree of autonomy, which over the last few years in particular it has used to attempt to trade up the product cycle. Moreover, recent reforms to management structure and wages have contributed to creating incentive structures in the firm which are more performance focused. However, similar to other large SOEs, Northern Shipbuilding has been burdened with "non-productive" social welfare functions and dabbled in non-core activities such as running a bus route and a hotel in which it has no expertise and has consequently sustained big losses. While some of these non-core activities are being separated, the socio-political constraint of maintaining a surplus workforce remains which impairs Northern Shipbuilding's ability to compete directly with the Japanese and South Korean shipbuilding companies.

## **Overview of China's State-owned Enterprise Reforms**

Since the beginning of the 1980s the Chinese economy has undergone a process of transition towards a market economy in a series of stages, which are well documented in the literature (see Choe and Yin 2000; Groves *et al* 1994; Lo, 1997 chap. 4; Yao 1997). The four stages of enterprise reform are the profit-retention reform during 1979-83, the tax-for-profit reform during 1983-86, the adoption of the contract management system during 1987-92, and the corporatisation of SOEs after 1992. The first three of these reforms can be described as various economic responsibility systems which tried to link compensation with effort in SOEs, but not change the ownership structure.

In the first phase of reform, in the profit retention reforms from 1979-83, enterprises began to be allowed to retain part of their profits for their own disposal, rather than handing in all profits to the state authorities. They were also granted autonomy in decision-making after fulfilling state planning targets. This represented a first step of departure from the central planning system where enterprises operated under state mandatory planning and were in nature just like divisions of the state administrative apparatus. The second phase was the tax-for-profit reform from 1983-86. Its objective was to gradually

substitute a uniform system of income taxes for the case-by-case bargaining regime of profit remittance, thereby leaving all enterprises to be responsible for their own profits and losses and to engage on an equal footing with each other in market competition. The problem, though, was that the state was not only the government, which collected taxes, but also the owner, which collected “dividends” that varied across enterprises. Theoretically, it is seldom possible for the state to have an arm’s-length relationship with SOEs. In practice, the state thus had to introduce an adjustment tax, the rate of which was negotiable for individual enterprises, in order to even out differences in profit-making across enterprises due to factors that were outside their control. Therefore the system of a case-by-case bargaining regime was resumed.

The third phase of reform involved the adoption of the contract management system. This system abandoned the pursuit of a standardised, generally applicable rate of state-enterprise division over enterprise profits. Instead, its aim was to fix the base of tax-and-profit remittance and to allow enterprises to keep all the above-base profit. This reform was designed to create the separation of ownership and control. While recognising that the state as the owner needs to be involved in case-by-case bargaining over enterprise remittance (“dividends”), the reform sought to make the bargaining formal rather than ad hoc. Moreover, the bargaining was mainly to be done between the state and other outside interested parties through a unified contract-issuing committee, on the one hand, and the enterprise management which represented all the inside members, on the other.

However, in practice the inevitable asymmetry in information between the management and the owner tended to result in soft-budgeted behaviour. There was serious asymmetry between responsibility for profits and responsibility for losses. As a result, enterprises tended to over-expand in good times, and to ask for re-negotiation over profit remittance in bad times. The state had serious difficulties in checking such behaviour, because, ultimately, it had almost unlimited responsibility for the survival of the enterprises. This systemic feature distinguished Chinese SOEs under the contract management system from capitalist corporations that operate under separation of ownership and control.

The fourth phase of reform has centred on ownership. Following the Fourteenth Communist Party Congress, held in November 1993, the Central Committee accepted proposals to transform large and medium-sized SOEs into joint stock companies (*gufen youxian gongsi*) or limited liability companies (*youxian zeren gongsi*) on a trial basis. In 1994 the government also started to experiment with small and medium-sized enterprise reform. A range of restructuring measures has since been tried in pilot areas which are designed to relieve small loss-making firms of their debts and to find new jobs for redundant workers. As a result of these reforms, the SOE share of gross industrial output has declined sharply with increased marketization. In 1980 SOEs produced 76 percent of gross industrial output value, but this fell to 28.2 percent in 1999 (ZTN 2000, p. 409).

The central government reaffirmed the *zhuada fangxiao* (“grasp the big and let go of the small”) reform program at the Fifteenth Congress of the Chinese Communist Party (CCP) in September 1997. Following the Fifteenth Congress, the central government announced three major policies to develop large and medium-sized SOEs. First, the government is developing a number of enterprise groups (*qiye jituan*) including 120 groups, known as the “national team”, which are the “generals” of the *zhuada* program (Sutherland 2001). Second, it wants to develop a modern enterprise system in large-scale SOEs by the year 2010. As part of the Ninth Five Year Plan (1996-2000), the central government selected 100 large SOEs to form the “core” of the “modern enterprise system”. At least 20 of these large SOEs are also core members of the 120 national team enterprise groups (Huang *et al* 1998). Third, it hopes to entrench three to five large firms in the world’s biggest 500. To this end, in 1997, the central government announced support for six large SOEs including Shanghai’s Jiangnan Shipyard.

The rationale offered by the Chinese authorities for developing large-scale SOEs and enterprise groups is to generate economies of scale and avoid excessive duplication. Nolan (1996) emphasizes the importance of mergers in upstream Chinese industries as a vehicle to develop economies of scale and scope. Scherer and Ross (1990) point out that in several sectors plants of less than a certain scale face substantial unit cost disadvantages. While there are not sizeable economies of scale in shipbuilding, economies of scale are possible through series production level (Amsden 1989, chap. 11). Prior to the recent restructuring and series of mergers the size of many shipbuilding companies was too small to achieve economies of scale. The annual average output of Chinese shipbuilding companies was less than 10,000 deadweight tons (DWT), which is one-fortieth the equivalent figure in Japan and one-twentieth the comparable figure in South Korea (Xu 2001). Prior to restructuring, the entire annual output of CSSC was less than one-half of the Weisan Ship Company owned by Hyundai in South Korea (Lu 2002). Only a handful of shipbuilding centres such as Dalian, Guangzhou, Tianjin, as well as Hudong and Jiangnan in Shanghai were able to produce vessels greater than 35,000 DWT. The central government’s objective in building bigger shipbuilding companies is to expand the number of shipyards which can produce 35,000 DWT ships and at the same time increase their capacity to produce 100,000 DWT ships which prior to the restructuring only shipyards in Dalian and Shanghai could produce (Cheung 1991).

## **Restructuring of the Chinese Shipbuilding Industry**

### *Organisational Arrangements and Restructuring in Shipbuilding*

In the first major Post-Mao restructuring of shipbuilding, in 1982 CSSC assumed control of all of China’s major shipyards, marine institutes and related equipment factories from the Sixth Ministry of Machine Building and the

Ministry of Communications. As a result, CSSC controlled virtually all major civilian shipbuilding in China including 26 shipyards, 66 factories, 33 research and development units and 3 institutes of higher education, while the Ministry of Communications retained control of a number of smaller yards producing coastal vessels (EEC 2000; Moore 2002: 175-177). In 1982 the workforce of CSSC was conservatively estimated to be 300,000 (Moore 2002: 175).

In 1999 CSSC was restructured into two large state-owned corporate groups – CSSC and CSIC. The reorganization was made broadly along geographical lines into north and south (EEC 2000). CSSC, which has headquarters in Shanghai, controls 30 shipyards in the south including those in Anhui, Guangdong, Jiangxi and Shanghai. Some of the main shipbuilding companies it controls are Guangzhou Shipyard, Guangdong Shipping, Jiangnan Shipbuilding, Hudong Shipbuilding, Shanghai Shipyard and Shanghai Global Container. In 1999 CSSC was ranked 31<sup>st</sup> and in 2000 it was ranked 36<sup>th</sup> among the 50 largest SOEs in China in terms of sales revenue (JRB 2001). It has assets, which are estimated to be worth 6.4 billion RMB and it employs 95,000 people (Chen 2001).

CSIC, which is based in Beijing controls 48 shipyards in the north with a focus on the major ports in Liaoning and Tianjin as well as operating 28 science, design and research units. It has five regional offices and 15 shareholding companies under its control (Zheng 2001). Some of the main shipbuilding companies it controls are Dalian Shipyard, Dalian New Shipyard, Qingdao Behai, Liaoning Shipyard and Tianjin Shipbuilding Corporation. In 1999 CSIC was ranked 38<sup>th</sup> and in 2000 it was ranked 46<sup>th</sup> among the 50 largest SOEs in terms of sales revenue (JRB 2001). It has assets, which are estimated to be worth 9.5 billion RMB and employs 170,000 people (RMRB 2001).

Running parallel with the restructuring of the shipbuilding industry into enterprise groups, since 1999 there have been some prominent instances of mergers of shipbuilding companies. For example, in 2000 the Jiangnan Shipyard and Qiuxin Shipyard and in 2001 the Hudong and Zhonghua shipyards both merged in Shanghai under the auspices of CSSC (Tian 2000, Murray 2001). Outside of the state-owned groups, there are some predominantly local shipyards operated by the Ministry of Communications or the Fujian or Jiangsu provincial governments. There are also a few joint venture shipyards (Kawasaki-COSCO, Raffles-Shandong and Samsung-Ningbo) and private shipyards, the most prominent of which is Guangzhou Shipyard International (EEC 2000).

### *High Level of Managerial Autonomy and Market Orientation*

The Chinese shipyards possess a high level of managerial autonomy. Cut-throat international conditions in shipbuilding have precipitated greater market-orientation. In the mid-1980s, in the face of a global recession in shipping, China was “thrown into competition” with Japan and South Korea. This acted as a catalyst for CSSC to decentralize authority over product planning

and business development to the shipyards including the right to negotiate directly with potential customers (Moore 2002). As a consequence, by the beginning of the 1990s, the shipbuilding companies were starting to use their managerial autonomy to make significant advances by importing critical equipment, using computer-aided design technology and introducing more sophisticated production and management practices at the yard level (Moore 2002, p. 167).

Writing soon after the formation of CSSC and CSIC, Moore (2002: 307) expresses concern that it represents a “recentralization of assets away from the yards”. This sort of comment, to some extent, reflects uncertainties about the boundaries of the firm. For the purpose of promoting industry giants that can compete with the big Japanese and South Korean shipbuilding companies, is the “firm” CSSC and CSIC or is it the subsidiaries that gained increasing autonomy through the reforms? While this remains uncertain (see Nolan 2001: 460-462), casual observation of how CSIC operates since its formation suggests that the shipyards have retained a high level of managerial autonomy. CSIC are attempting to procure economies of scope through group purchasing to get bulk discounts and use their market power to force suppliers to increase the quality of their service as well as considering setting up a trading company for group marketing.<sup>5</sup> CSIC also sets annual salaries in a bid to keep costs down and foster reinvestment for growth, but they do not interfere in day-to-day management. This conclusion is supported by an EEC Report (2000: 31), which concludes: “While the two groups [CSSC and CSIC] have been given responsibility for managing and increasing asset values for the State, it is left to individual units to determine their product mix and pricing policies. The umbrella groups will not contract on behalf of members and will not intervene in day-to-day business unless an activity is deemed to be damaging to the overall industry”.

Nolan (2001 chap. 13, 2002) and Nolan and Zhang (2002) express concern about whether China’s large SOEs are ready to compete on a level playing field, now that China has joined the WTO. However, the fact that the shipbuilding sector has long been open to foreign competition with low tariffs, means that this is less true for shipbuilding than some other industries (Research Group 1997; Liu 2000). The Chinese government has maintained a 9 percent tariff and 17 percent value added tax on imported ships, which is much lower than that on other imported goods such as automobiles (Zhang 2002). The China Ocean Shipping Company (COSCO) is already a large procurer of ships from foreign shipbuilding companies (Moore 2002). One problem is that foreign companies, which will have direct access to the domestic market, might not renew license agreements with Chinese firms, which will affect firms that depend on licensing arrangements for technological

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<sup>5</sup> Prior to restructuring, CSSC had a Trading Company which took some orders in addition to orders taken by the shipyards. After CSSC was restructured into CSSC and CSIC, the Trading Company continued to exist, but because it has a closer connection with the southern shipyards, it mainly gives orders to them. Thus, CSIC’s decision to set up its own Trading Company is an attempt to get its own group orders.

transfer (Yu 2001). This is expected to have an adverse effect on the marine product industry because it does not possess its own core technology (DRC 2001). Equally, though, admission to the WTO might be expected to help the shipbuilding industry through reducing tariffs on imports of advanced technologies (Hugar 2001).

### *Product Diversification, Technological Transfer and Trading Up the Product Cycle*

Since the mid-1980s, in addition to generating rapid growth in output China's shipbuilding industry has diversified into a range of marine products, such as ship engines and deck machinery, as well as non-marine products, including various forms of light and heavy industries. By the late 1980s CSSC started to resemble the archetypal late industrializing East Asian conglomerate. As Moore (2002: 226) describes it:

[B]y the late 1980s the brochures for all of CSSC's major yards read like catalogues for large, diversified manufacturers. In addition to the expected marine-related products, yards were building complete sets of machinery and assembly line equipment, including loading and unloading machinery for coal terminals, generators and blast furnaces, high pressure vessels for various gases and chemicals and heavy duty hydraulic lifts, presses and cranes. These products went to industries as diverse as paper manufacturing, textiles, petrochemicals, waste treatment and tobacco processing. In light industry CSSC factories produced everything from bicycles and yarn cleaners to gas meters and batteries.

Since the late 1970s China has been a massive importer of foreign technologies in shipbuilding and allied areas such as ship repair. Starting in the mid-1980s China built up a ship repair industry through importing ship repair technologies from scratch (Moore 2002: 228). China has also used technologies obtained from foreign companies through production licenses and co-production agreements to trade-up the product cycle into more advanced ships. In this respect, typical of a late-industrializing conglomerate, CSSC was initially a ship assembler reliant on foreign design parts and technologies than a self-contained assembler. However, it later attempted to simulate the foreign technology through increasing the domestic content and finally using the know-how obtained from the imported technologies to develop new Chinese designed products in ships (Moore 2002: 233). Chinese shipbuilding also benefited from learning from Japanese and South Korean shipbuilders. From the late 1980s to the mid-1990s CSSC sent between 2000 and 3000 people to Japanese and South Korean shipyards to learn new technologies. This approach to obtaining technological transfer was similar to the South Korean giant shipbuilder Hyundai Heavy Industries in its formative stages, which dispatched engineers to Western Europe to learn new technologies (Amsden 1989: 276).



Through a combination of foreign technical assistance and learning by doing, by the early 1990s Chinese shipyards had traded up from traditional bulk carriers and oil tankers to state-of-the-art freighters and specialized ships. The range of ships China could build included shuttle tankers, product-chemical tankers, refrigerated containerships and roll-on-roll-off vessels used to transport products such as cars. While some were produced to meet local demand, most of these higher value added ships were being produced for export (Moore 2002: 165). This was consistent with the objective of CSSC, which was to “make imports foster exports” (*yijin yangchu*) (Moore 2002: 233).

### *Effects of a High Debt/Asset Ratio*

The shipbuilding industry exhibits a high debt-asset ratio. It has been argued that this was one of the main factors driving the restructuring of the industry in 1999 (EEC 2000, 2002; Moore 2002). Subsequent to the restructuring, in 2001 the debt-asset ratio in CSIC was 78 percent. This is similar to large South Korean shipbuilding companies. In the first quarter of 2001 in Daewoo Shipbuilding and Marine Engineering the debt-asset ratio was 78 percent. The comparable figure in Hanjin Heavy Industries was 68 percent, while in Hyundai Heavy Industries it was 66.5 percent and in Samsung Heavy Industries it was 70 percent (Daewoo Securities 2001). While these figures are high, at one level, we need to be careful in interpreting their meaning. To some extent, it is a reflection of the manner in which the accounting procedures in the industry treat debt. When a contract is signed for the delivery of a ship, all payments paid up to the final delivery of the ship are treated as debt. Thus, the deposit and instalments are treated as debt until the final instalment is made. This tends to exaggerate the true debt/asset position.

At another level, the debt/asset ratio is a reflection of the nature of the industry. Firms are forced to take out both long-term loans to finance capital construction, such as building a new shipping deck or putting in a new production line, and current loans to meet the cost of delivering ships. Moore (2002) emphasises the problems caused by a combination of soft budget constraint and hard market constraint. He states (245-246) “[u]ltimately the financial responsibility borne by the yards was not commensurate with their autonomy over matters such as production and pricing” and as a result “the yards showed little financial discipline since ... losses were largely covered by CSSC”.

However, from a different perspective, it can be argued that some degree of soft budget constraint was positive for the long-term development of the shipbuilding industry. Lo (1999a: 14) makes the general point: “In the context of China, an economy under systemic reform and structural change, it is conceivable that the development of entrepreneurship takes time and that this development can be interrupted by fluctuations in the institutional and development market. Hence a soft budget constraint is instrumental in protecting potentially efficient firms from being wiped out by fluctuations

(though it also protects inefficient firms at the same time)". This extends to movements in international markets such as fluctuations in world shipping prices. The fact is that the rapid growth in the shipbuilding industry would not have occurred without a soft budget constraint. While there were short-term costs in the form of losses, access to credit was vital in winning the orders that provided the basis for the acquisition of market knowledge and technical expertise that allowed firms to trade up the product cycle.

It is also worth noting that China is not the only country that subsidizes its shipbuilding industry. In periods of downturn in prices most shipyards around the world, including those in Japan, South Korea and Western Europe have been forced to "buy" new orders, with the backing of government funding, which is precisely the course that China followed. There is precedent for China's approach in the experience of other late industrializing countries. The South Korean shipbuilding industry grew from almost nothing in the 1970s to take over from Japan as the biggest recipient of shipbuilding orders in the world in the late 1990s on the back of massive bank debt financing (Amsden 1989). In the mid-1980s, at the height of the world shipping recession, it is estimated that shipbuilding subsidies in South Korea were well in excess of one-third of the price of a new ship (Moore 2002: 202). Even in the early 1990s when shipbuilding was going through a relative period of prosperity, official US estimates of shipbuilding subsidies in Japan, South Korea and Western Europe were still in the range of 20-25 percent of the price of a new ship (United States International Trade Commission, 1992).

## **Overview of Northern Shipbuilding**

In the rest of the article we investigate reforms in shipbuilding through a case study of Northern Shipbuilding, which was established at the beginning of the 1990s and became a subsidiary of CSIC in 1999. In 2001, Northern Shipbuilding was in the largest five shipbuilding companies in China in terms of exports, jobs completed and output value and in the 10 largest shipbuilding companies in China in terms of new orders received (British Embassy 2002). In terms of sales revenue it ranks between the 200<sup>th</sup> and 300<sup>th</sup> biggest SOE in China (ZDQN various). It resembles a large diversified manufacturer. Apart from shipbuilding, ship repair and marine products, Northern Shipbuilding produces large-scale steel structures for high buildings and bridges. It was the first shipbuilding enterprise in China that could build vessels up to 300,000 DWT. Among the ships it has built are a 300,000 DWT crude oil carrier, 5,600 twenty-foot equivalent unit (TEU) container ship, 150,000 DWT bulk carrier and 115,000 DWT shuttle tanker.<sup>6</sup>

In October and November 2002, we conducted multiple in-depth interviews with a member of the senior management group of Northern Shipbuilding, who was in charge of economic restructuring in the firm. He

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<sup>6</sup> Document 4, supplied by Northern Shipbuilding, October 2002.

had worked in the shipbuilding industry for close to 50 years and had an unprecedented knowledge of the workings of the firm and the shipbuilding industry in China in general. All of the questions were supplied to the firm in advance of the interviews and we were provided with written responses to those questions plus additional printed materials and statistical information on the firm before the interviews took place. The interviews were used to get clarification on issues that were unclear as well as seek further elaboration on the written answers.

We are confident that the information provided in the interviews with firm representatives is accurate for two reasons. First, the interviews were arranged through the third author who works for CSIC in Beijing and CSIC made it clear to Northern Shipbuilding that we had its backing for the research. Without this support we could not have got access to the firm. Second, the senior manager with whom most of the interviews took place was forthcoming and open in responding. There was no hesitation in responding to any questions because of uncertainty about what he could or could not tell us, which might have been the case with a less senior manager.

## **Patterns of Growth in Northern Shipbuilding**

### *Maximising Output: Up to 1995/96*

We begin with a discussion of growth patterns in the firm. Table 1 presents financial indicators for Northern Shipbuilding between 1991 and 2001, which is based on a similar table supplied by the firm as part of the written documentation.<sup>7</sup> Between 1991 and 1994 the firm only had one Slipway, which meant that it could only build one ship at a time. At the end of 1994 there was a change in the leadership of the firm and a Dry Dock was constructed in addition to the existing Slipway. It was possible to produce two ships at the one time in the Dry Dock. Therefore, there was an increase from one production line (on the Slipway) to three production lines (one on the Slipway and two in the Dry Dock).

The advantage of having three production lines is that it increased the utilization rate on equipment and meant that depreciation on capital equipment could be spread across the three ships being built at the one time. With the installation of the Dry Dock, the new leadership expected a big leap in output and emphasis was placed on maximizing output without attention to cost considerations.<sup>8</sup> In 1996 there is a big increase in sales revenue and average

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<sup>7</sup> The firm supplied the data in nominal terms and provided a different measure of productivity based only on the number of formal employees. We have calculated real measures of sales revenue and wages and constructed different estimates of productivity which also takes into account contract workers.

<sup>8</sup> Interviews with informant 1, senior manager in charge of economic restructuring, Northern Shipbuilding, October-November 2002.

wages, but at the same time, a drop in labour productivity and profits.

**Table 1: Economic Indicators of Northern Shipbuilding**

Year	Pre-tax Profit (10,000 RMB)	Sales Revenue (10,000 RMB) (1990=100)	Number of Formal Employees <sup>(a)</sup>	Average Wage (1990=100)	Labour Productivity (10,000 RMB/Person) <sup>(b)</sup>
1991	242	18842	4688	3596	3.24
1992	1007	57666	4633	3999	10.24
1993	1537	20880	4424	4977	3.85
1994	2338	50654	4594	5832	9.06
1995	4074	65702	4748	6950	11.43
1996	1015	78560	5099	8414	7.78
1997	-14838	98934	4676	8108	10.22
1998	1123	109148	4300	9053	11.74
1999	1481	103376	4372	8099	11.03
2000	259	84572	4600	8966	8.81
2001	158	76200	4475	10008	8.04

Notes:

Sales revenue and average wages are expressed in real terms (1990=100).

Formal Employees do not include contract workers.

The productivity figure is calculated through dividing real sales revenue by the number of contract workers plus the number of formal employees. We do not have exact figures on the number of contract workers, so we use the lower bound estimates provided in interviews. These are 1000 (1991-95) and 5000 (1996-2001). For this reason the productivity figures should be regarded as upper bound estimates.

Source: Based on Document 2 supplied by Northern Shipbuilding, October 2002.

With three production lines Northern Shipbuilding signed contracts for the delivery of several ships in short sequence. According to the contracts, each ship had to be delivered at six-month intervals, which is standard industry practice. This created several problems.<sup>9</sup> First, in order to operate the three production lines simultaneously and attempt to meet the contract deadlines, the firm had to borrow to bring delivery of the second and third ships forward. Because the interest rate at the time was high (around 10 percent per annum), the total cost of the borrowing was about 25 million RMB per annum. Second, the firm could not match production schedules with delivery targets. As a result, some ships were built ahead of the scheduled time, while some were well behind schedule and, in the case of these ships, the firm had to pay penalties on late deliveries. Third, in order to meet the extra production, the firm was forced to hire more workers. There was a small increase in the number of formal employees in 1995-96, which shows up in table 1, but most

<sup>9</sup> Ibid and documentation supplied by Northern Shipbuilding, October 2002.

of the additional production was met through hiring teams of contract workers.

### *Profit Contract and Contract Workers*

Prior to 1995 Northern Shipbuilding had between 1000 and 1500 contract workers, but subsequent to 1995 it had between 5000 and 6000 contract workers. These were in addition to its formal employees.<sup>10</sup> Most of the contract workers came from outsourcing teams. According to the National Regulations contract workers cannot mix with formal employees, so outsourcing teams had to be brought in for entire jobs. The use of outsourcing teams is common throughout the shipbuilding industry (EEC 2000). In Northern Shipbuilding, before 1995 there were three outsourcing teams working in Northern Shipbuilding; however, after 1995 this figure increased to 10.<sup>11</sup>

Northern Shipbuilding was forced to use contract workers to meet the extra production because of a ceiling on wages that could be paid to formal employees under its profit contract. As CSIC is under the direct control of the central government, the Ministry of Labour sets a maximum wage pool based on its total number of employees, from which it allocates wage quotas to its subsidiaries. The wage quota is adjusted each year. For firms which make a loss it is adjusted downwards and for firms which make a profit it is adjusted upwards. For each additional 1 RMB of profit, wages are adjusted upwards between 0.3-0.7 RMB. The objective is to link wages with firm performance and keep costs down.<sup>12</sup> This is similar to other large SOEs such as Shougang. In Shougang the relationship between profits and wages was set at a fixed ratio of 1 to 0.8 (Steinfeld 1998: 176). Based on their number of employees, the wage quota for Northern Shipbuilding allocated by CSIC is approximately 90 million RMB per annum allowing for changes in profits from year to year. This is the maximum amount Northern Shipbuilding can pay its formal employees without incurring a penalty tax of 33 percent of any excess paid; however, it was able to avoid the penalty tax through hiring contract labour. The widespread introduction of contract labour to boost output had a negative effect on worker morale as there was a widespread feeling among the workers that they were working to increase the profits of the teams. This was exacerbated by chaotic conditions on the production lines, which meant that a number of ships were not delivered.<sup>13</sup>

### *Asian Financial Crisis: Since 1997*

The period since 1997 has been one of consolidation and diversification. In

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<sup>10</sup> Ibid.

<sup>11</sup> *ibid.*

<sup>12</sup> *ibid.*

<sup>13</sup> *ibid.*

1997 there was a second change in the leadership of the firm. The first objective of the new leadership was to sort out overdue ship orders. As a consequence from July 1997 to July 1998, Northern Shipbuilding delivered 10 new ships.<sup>14</sup> This shows up in table 1 as a big jump in sales revenue and labour productivity in 1997 and 1998. The jump in labour productivity, though, is a statistical anomaly because parts of the 10 ships delivered in 1997 were manufactured over several years so the 1997-98 figures are lumpy.

At the same time, the Asian Financial Crisis resulted in a sharp fall in orders. In 1997, as a culmination of the chaos on the production lines in 1995-96 coupled with the effects of the Asian Financial Crisis, Northern Shipbuilding experienced a large loss which was greater than its profits in all other years combined. The lingering effects of the Asian Financial Crisis are reflected in sales, which reached a peak in 1998 and have been falling since. Immediately following the Asian Financial Crisis, Chinese shipyards took no orders for several months and experienced slow business for at least two full years (Moore 2002: 15). Following the Asian Financial Crisis there was a 20 percent drop in world shipping prices. For example, in 1998 the price of a 110,000 DWT oil carrier was \$US 43 million, while in 1999 it was \$US 33-35 million.<sup>15</sup> The 20 percent price drop had no effect on South Korean shipbuilders because the Won depreciated significantly relative to the US dollar over the same period, but the RMB has been stable relative to the US dollar. This has hurt Chinese shipbuilding exports (EEC 2000; Moore 2002).

The difference in the competitiveness of Chinese and South Korean shipbuilders has been exacerbated through the relative domestic and imported steel content of Chinese and South Korean ships, which makes up 75 percent of the price of producing a ship. The domestic and overseas steel content of ships produced in China depends on whether the ship is being produced for the domestic or overseas market. For ships produced for the domestic market, Northern Shipbuilding uses 100 percent domestic steel. For ships produced for an overseas customer for the first one or two ships 70-80 percent of the steel is imported; however, after the second ship, in a multi-ship contract, Northern Shipbuilding will negotiate to increase the content of Chinese steel.<sup>16</sup> In contrast, in South Korea domestically produced steel accounts for 70-80 percent of the steel content (Lee 1999). It has been suggested that the reason why Chinese shipbuilding yards use so much Chinese steel is the central planning system. According to the EEC (2000; 33):

Steel prices have been rising rapidly within China at an average annual rate of 6 percent over [the 1990s]. The current price for Grade A steel as used in shipbuilding is probably higher than the price at which steel could be purchased from the Korean mills but under the centrally planned system, shipyards are often directed to

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<sup>14</sup> *ibid.*

<sup>15</sup> *ibid.*

<sup>16</sup> *Ibid* and Document 12 supplied by Northern Shipbuilding, October 2002.

purchase from local mills, in some cases irrespective of whether the steel is needed or not. This has led to the situation where many of the traditional yards in the state sector are choked with inventory and steel stocks.

At the interviews, however, a different view was offered for Northern Shipbuilding having a high domestic steel content. Rather than seeing the requirement of sourcing steel locally as a burden, Northern Shipbuilding welcomed the opportunity to increase the domestic steel content and took advantage of every opportunity to increase the Chinese steel content in ships produced for foreign ship owners. The interviewee expressed the view that South Korean shipbuilders had an advantage in having a high domestic steel content, worth emulating, because they do not have to be as concerned as Chinese shipbuilders with fluctuations in international steel prices or exchange rate fluctuations. One option for Northern Shipbuilding to address the problem of exchange rate fluctuations would be via hedging, but at the interviews it was argued that this was often not viable because Northern Shipbuilding did not have the funds to cover the hedge.

### *Trading Up the Product Cycle*

The response of Northern Shipbuilding to the Asian Financial Crisis has been to trade-up into higher value added areas, which require higher technologies and simultaneously attempt to attract foreign direct investment. Since the Asian Financial Crisis, it has become the first Chinese shipyard to enter the large containership and tanker markets. In 1999 it beat a strong field including Mitsubishi and Daewoo to win a contract to build five VLCCs of 300,000 DWT for an Iranian shipping firm, which is worth \$US 360 million. In 2000, it signed contracts to build four 5,600 TEU ships for the China Shipping Group.<sup>17</sup> The major benefits of signing contracts for delivery of multiple ships of the same specification are twofold. It allows the firm to build in series, which generates economies of scale and it facilitates learning-by-doing (Amsden 1989: 277).

To get the containership technologies it adopted a two-prong approach. First, it developed the technologies in its own Ship Design Research Institute to build 4000 TEU containerships in the Ninth Five Year Plan. Second, it joined forces with a shipyard in Shanghai under the control of CSSC to collaborate in building 5600 TEU ships. The Shanghai shipyard had independently been developing containership technologies throughout the 1990s, starting with 1000 TEU ships and building up to 2000 TEU ships.<sup>18</sup>

The development of the VLCC technologies occurred in three stages: preliminary design, detailed design and production design. Northern Shipbuilding's Ship Design Research Institute carried out the preliminary design stage as part of the Eighth and Ninth Five Year Plan. This entailed

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<sup>17</sup> Northern Shipbuilding promotional brochure, supplied October 2002 and informant 1.

<sup>18</sup> Document 13 and Northern Shipbuilding promotional brochure, supplied October 2002.

determining whether the firm had the capabilities to implement the VLCC technologies. However, to move into the detailed design and production design stages the firm needed to get the technologies from Japan or South Korea, which were the only countries that could build VLCCs. Northern Shipbuilding first negotiated with the Japanese and South Korean shipbuilding companies to acquire the VLCC technologies, but they refused to supply the technologies at any price. The firm then contacted a research design institute in South Korea that designed the technologies for the South Korean shipbuilding companies. It supplied the technologies in 1999, just before Northern Shipbuilding signed the agreement to deliver the VLCCs to Iran.

Northern Shipbuilding has also diversified into building marine engineering equipment, such as Bingo-9000 rigs, since the Asian Financial Crisis. The profit margin, which Northern Shipbuilding makes on the marine engineering equipment is 33 percent, while on shipbuilding it is only 6 to 7 percent. The firm, however, still needs to manufacture ships because the marine engineering equipment involves state-of-the-art technology with a very high rate of depreciation. Northern Shipbuilding has not received any foreign investment, but at the time of the interviews was in preliminary negotiations with a US firm that is interested in investing in the marine engineering technology.<sup>19</sup>

## **Restructuring in Northern Shipbuilding**

### *Financial Restructuring*

At the end of 1999, Northern Shipbuilding had two long-term loans denominated in RMB.<sup>20</sup> One loan was from the State Development Bank for 577 million RMB and the other was from the Construction Bank for 164 million RMB. Northern Shipbuilding also had one long-term loan from the Bank of China for 4528 million Yen. In March 2000 most of this debt was converted into equity when CSIC and Northern Shipbuilding signed a debt-equity swap. With a debt-equity swap, state-owned Asset Management Companies (AMCs) purchase the designated debt of the state-owned bank with which they are paired at face value. In order to pay for the debt/equity, the AMCs issue bonds to the bank at face value. After the debt owing to the banks is converted into equity, the AMC becomes a shareholder in the debtor enterprise (Steinfeld 2001; Smyth and Zhai 2002).

CSIC and Northern Shipbuilding signed a debt-equity agreement with the State Development Bank and the Orient, Huarong and Xinda Asset

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<sup>19</sup> Informant 1 and Documents 14 and 15, supplied by Northern Shipbuilding, October 2002.

<sup>20</sup> Unless indicated otherwise, information in this section is from Documents 18-23, supplied by Northern Shipbuilding, October 2002 and the interview with informant 2, the middle-level financial manager, Northern Shipbuilding, October 2002.



Management Companies (AMC).<sup>21</sup> Table 2 shows the debt transferred in the swap and table 3 shows the shares and seats on the Board of Directors and Supervision Committee of each of the parties.

**Table 2: Debt Transferred in the Debt-Equity Swap at Northern Shipbuilding**

Creditor	Item	Debt	Debt Transferred	Remaining Debt
State Development Bank	Total	42691	42691	
	Capital	41100	41100	
	Interest	1591	1591	
Xinda AMC	Total	30029	30029	
	Capital	26750	26750	
	Interest	3279	3279	
Huarong AMC	Total	20000	20000	
	Capital	20000	20000	
	Interest			
Orient AMC	Total	25530	12694	12836 <sup>(a)</sup>
	Capital	24919	12083	12836
	Interest	611	611	

Notes: (a) Not all of the debt owing to the Bank of China, which is paired with Orient, was due. Only loans that were due are included in the debt-equity swap. (Units 10,000 RMB)

Source: Document 22 supplied by Northern Shipbuilding, October 2002.

**Table 3: Equity and Seats on the Board of Directors and Supervision Committee at Northern Shipbuilding Following the Debt-Equity Swap**

	<i>Equity</i> (million RMB)	Seats Held on the Board of Directors	Seats Held on the Supervision Committee
State Development Bank	426.91	3	1
Xinda AMC	300.29	2	1
Huarong AMC	200.00	1	1
Orient	147.93	1	1
CSIC (including land)	796.15	2	1
Northern Shipbuilding		4 (including chairman)	2
Total	1871.28	13	7

<sup>21</sup> Xinda is attached to the China Construction Bank, Orient is attached to the Bank of China and Huarong is attached to the Industrial and Commercial Bank of China. Huarong were involved in the debt-equity swap because Northern Shipbuilding had some bad current loans from Industrial and Commercial, although they had no long-term loans. While theoretically only long-term loans are included in debt-equity swaps, in practice some current loans have also been swapped.

Source: Documents 22 and 23 supplied by Northern Shipbuilding, October 2002.

Before the debt-equity swap the debt-asset ratio of Northern Shipbuilding was 94 percent. The high debt-asset ratio partly reflected the firm's high level of borrowing first for capital construction to build the Dry Dock in the mid-1990s and then meet the delivery of ships in short sequence from 1995-1997, when it concentrated on output maximization. After the swap, it fell to 65 percent. The AMCs can exercise their voting rights through the Board of Directors; but, as in other industries, their influence is restricted because of a lack of knowledge of the shipbuilding industry. The influence of the directors representing the AMCs is not as significant as the other directors. However, on some issues, the AMCs have outvoted CSIC. CSIC put forward a proposal not to allocate dividends to shareholders in 2000-01 because the performance of Northern Shipbuilding was not good, but the AMCs vetoed the proposal with the result that the dividends were paid. The AMCs plan to sell their shares to third parties, but this might prove difficult because of the requirement that the shares are sold at a one to one face value.<sup>22</sup>

There are four projects for which Northern Shipbuilding has received preferential support since the debt-equity swap. First, it received funding for the production design stage of the VLCCs worth 300 million RMB over the period 1999-2002, made up of bank loans, interest subsidies from the government and funds raised through reinvesting profits and contributions from CSIC. A second project for new product development worth 140 billion RMB started in 2000 consisting of bank loans and government subsidies. Third, Northern Shipbuilding received a further 200 million RMB in 2001 from the State Economic and Trade Commission for new product development. The fourth project is funding to improve infrastructure capacity, which was approved in 2002. The total value of this project is 260 million RMB, made up of bank loans and firm reinvestment.

### *Restructuring the Labour Market*

In 1997, the State Commission for Economic Restructuring estimated that the number of surplus workers in SOEs was 54 million, close to half the total workforce.<sup>23</sup> This figure is broadly consistent with case studies of large SOEs in the South-West and North East of China, which suggest surplus labour is between 10 and 60 percent of total employees (Kuehl and Sziraczki 1995: 75; Morris *et al* 2001: 699-700). Over-manning is regarded as a major problem in Chinese shipyards. (EEC 2000: 29). Idle time is typically very high. According to the EEC (2000: 32) idle time is around 17 percent of hours paid

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<sup>22</sup> The AMCs can sell their shares at less than one to one face value with the permission of the Central Bank and Ministry of Finance, but the process is bureaucratic. The AMCs have been lobbying the Central Bank and Ministry of Finance to give them more flexibility in pricing shares for sale to third parties.

<sup>23</sup> *South China Morning Post* May 7, 1997, cited in Morris *et al* (2001: 699).

in the more productive Chinese shipyards and is much higher than this in the less efficient shipyards. The productivity of China's shipbuilding industry is estimated to be as low as one-twentieth the figure in Japan and South Korea (Xu 2001).

Surplus labour is a big problem in Northern Shipbuilding. At the interviews we were told that administrative/managerial staff could be reduced by one-half to two-thirds, production workers could be reduced by one-half and outsourcing teams reduced to one-tenth of their current level without a fall in output. However, while labour productivity could be improved with more flexible labour markets, it is not possible to simply fire workers. Downsizing of this magnitude is simply not feasible given the political realities of the reform process. There would be much staff resistance and the firm would have to find new positions for those who lose their jobs in its non-core businesses.<sup>24</sup>

This is because the Chinese government sees the prospect of wide scale unemployment as intolerable. In Central Eastern Europe and the former Soviet Union unemployment following the collapse of socialism resulted in civil disorder and social instability (Qiu and Zheng, 1998). In contrast China has pursued economic reform without political reform (Shirk, 1993) and the Chinese government views the potential for social instability associated with large-scale unemployment as a potential threat to the one party state. Redundancies have already led to mass demonstrations, in particular in the South West and North East of China (Morris *et al* 2001: 705-706). While the Chinese government has largely dropped the Mao-era rhetoric of the virtues of the working class and their right to lead the state, the workers themselves continue to use the old formulations about being the leading class, which is proving uncomfortable for the government (Morris *et al* 2001: 709). In this respect, restricting the level of open unemployment, amounts to taking pre-emptive action to "to limit potential political instability and maintain working-class support" (Frenkel and Kuruvilla, 2002, p. 390).

There are various methods available to disguise the true level of unemployment. One common approach in China to reduce the number of surplus workers is to give them the administrative tag *xiagang*, meaning they are "on leave" from the enterprise. This means that they retain their ties with the enterprise and the enterprise is obliged to pay them a subsistence allowance. According to official figures there were 26 million workers laid-off between 1998 and 2002 (Armitage 2003). Somewhat surprisingly, Northern Shipbuilding did not have any *xiagang* workers as such, although 200 workers, who have been transferred to the firm's service companies were "laid-off" for disciplinary reasons.<sup>25</sup> These workers were not re-employed following the restructuring of their work unit and were described as "lazy workers" in the interviews.<sup>26</sup> Amongst others, Rawski (1999) has observed that in China the label *xiagang* is sometimes used as a disciplining device to

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<sup>24</sup> Informant 1.

<sup>25</sup> Document 17 supplied by Northern Shipbuilding, October 2002.

<sup>26</sup> Informant 1.

increase performance. This sort of arrangement has also been observed in case studies of large SOEs in the petrochemical sector (eg Smyth et al 2001).

Another approach to reducing the workforce is to ask workers to take semi-retirement (*neitui*) (Morris et al 2001: 703). Northern Shipbuilding has 180 workers which are semi-retired.<sup>27</sup> At Northern Shipbuilding males and females in lower management and technical positions can apply for semi-retirement at the age of 55 and 50 respectively; however, for some jobs that involve poisonous materials or are otherwise hazardous to health, the semi-retirement age is much earlier. Workers who are semi-retired receive 50-70 percent of their position wage, but no bonuses.<sup>28</sup> Northern Shipbuilding is considering reducing the semi-retirement age for middle-level managers, but the motivation is not to reduce surplus labour. Instead, the senior management group is concerned that the thinking of the existing middle-level management is too conservative and wants to replace them with younger managers with more aggressive strategies.<sup>29</sup>

### *Establishing a Modern Management System*

Studies of SOE management up to the mid-1990s suggested that political interference in management was a major problem (Child 1994; Chen 1995). However, more recent studies suggest that while the government continues to appoint senior management, political interference in senior and middle level management has reduced over time. Based on case studies of large SOEs in Liaoning, Smyth and Zhai (2003: 189) argue that it is the General Manager who is responsible for the success or failure of the enterprise in most SOEs rather than party committees. Steinfeld (1998) also stresses the importance of performance over politics in large SOEs. He writes (at p. 105): “distinctions between the political functions of party cadres and the ‘professional’ or ‘managerial’ functions of administrative cadres have, for the most part, disappeared. In a sense, everybody is a business person today, including the party people”. The General Manager of CSIC and CCSS, in conjunction, with their leadership group, appoint the senior management in the shipyards under their control and the central government has significant input into this process. However, our interviews suggest that with the exception of labour policies where the government exerts pressure to maintain more workers than the firm needs, there is little political interference in management.<sup>30</sup>

Recent studies have highlighted that the ratio of managers in SOEs with university degrees has increased over time (eg Smyth *et al* 2001; Smyth and Zhai 2003). This reflects the fact that the criteria for promotion in SOEs is now much more focused on performance than in the past. Table 4 shows the educational qualifications of managerial/technical staff and skilled workers in

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<sup>27</sup> Document 17 supplied by Northern Shipbuilding, October 2002.

<sup>28</sup> Informant 1.

<sup>29</sup> Ibid.

<sup>30</sup> *ibid.*

Northern Shipbuilding. Over 30 percent of managerial/technical staff had at least a Bachelor's degree. A further 25 percent of managerial/technical staff had some other form of specialized tertiary education.

With one or two well-reported exceptions, such as Shougang, in the past demoting managers for poor performance was relatively uncommon. Writing about the situation in the early to mid-1990s Steinfeld (1998: 204) comments: "At most large state firms, demotions are rare ... Officials displaying the most extraordinary ineptitude are simply shuffled horizontally, moving from position to position, until they are effectively sidelined from the firm". However, more recently this has started to change. Smyth and Zhai (2003: 187) found that by 2000 demotion of managers for poor performance was fairly common in large SOEs in Liaoning. This is part of a more general trend towards reforming the "iron rice bowl" and "iron arm chair" of lifetime employment for cadres. Drawing on interviews in 10 large and medium-sized SOEs between 1995 and 2000, Morris *et al* (2001: 711) report that some managers in SOEs were being employed on three-year contracts, which can be terminated for failing to meet performance criteria. At the start of 2003, the Chinese government announced that employment contracts will be introduced for all SOE workers over the course of the next three years (CD 2003).

**Table 4: Education Qualifications of Managers and Workers in Northern Shipbuilding**

Qualifications	Managerial/Technical Staff (%)	Skilled Workers (%)
Postgraduate	1.1	—
Bachelor	29.5	0.1
Specialized Tertiary	24.3	2.5
Secondary Technical	19.1	6.5
Senior Secondary	14.0	31.0
Junior Secondary and Below	12.0	59.9

Source: Document 15, supplied by Northern Shipbuilding, October 2002.

In Northern Shipbuilding each manager receives an annual performance assessment conducted by the human resources department and a supervisor's assessment conducted by the manager's supervisor.<sup>31</sup> Since the debt-equity swap, all managerial positions are thrown open to competition in March each year, once the results for the previous year are known. As part of the debt-equity swap, Northern Shipbuilding was required to introduce wage reform. Introducing competition for managerial positions is seen as an important step towards wage reform as workers are less likely to resist the idea of paying higher salaries to management if they are given the opportunity to compete for the positions. Theoretically, anyone within the company who satisfies the

<sup>31</sup> Unless indicated otherwise, information in this paragraph and the next paragraph are from the interviews with informant 1 and document 17, supplied by Northern Shipbuilding, October 2002.

minimum criteria in terms of age, experience and qualification can apply for a managerial position in March each year; however, in practice the competition will be restricted to positions where the manager fails his/her annual assessment and/or supervisor's assessment.

Even if the manager is performing well, if he/she is approaching retirement age the firm will often create a deputy's position and invite applications for that. All positions up for competition are advertised within the firm. All applicants must give a presentation and attend a formal interview. The outcome is based on the interview and presentation. As a result of this process, the annual turnover of management, due to both retirement and unsatisfactory performance in the short period since the reforms were introduced has been about 30 percent, with about 10-15 percent moved because of poor performance. This is an extremely high figure compared with what previous research suggests is the norm in large SOEs. For example, Steinfeld (1998: 205) records that even in Shougang in the early-to-mid-1990s, which was famous throughout China for demoting managers for poor performance, only 9 percent of managers each year suffered demotions. However, the high figure for management turnover in Northern Shipbuilding is linked to restructuring of the firm, in particular departmental mergers and introduction of semi-retirement arrangements for managers, and therefore it is unlikely that this high rate will be maintained once the current bout of restructuring is concluded.

### *Wage Reform*

Moore (2002: 244) notes the one mechanism for improving performance in Chinese shipyards has been to use bonus systems aimed at increasing micro-level responsibility for meeting delivery deadlines, with goals for meeting deadlines constituting up to 40 percent of wage payments. This is true for Northern Shipbuilding with the objective of linking wages with performance. In Northern Shipbuilding wages consist of four components: (i) position wage, (ii) experience wage, (iii) skill subsidy and (iv) bonus.<sup>32</sup>

(i) Position Component: Each worker is allocated a coefficient band, with the base wage of 800 RMB equal to 1. The coefficient bands were widened as part of wage reforms designed to reward better performance following the debt-equity swap. Among the managerial/technical staff the coefficient band for the General Manager is 5-6.5; the coefficient band for the Deputy General Manager is 4-5.25; the coefficient band for the Head of a major department is 3-4; the coefficient band for the Head of a lesser department is 2.6-3.5; the coefficient band for the supervisor of a workshop is 2-3.5 and the coefficient band for technical workers is 1-1.75. For service workers the coefficient band varies between 0.75 and 1.5. The position within the band is assessed each month according to targets.

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<sup>32</sup> Explanation of wage components is taken from the interview with informant 1.

Production workers are paid on a piece-wage basis. Northern Shipbuilding allocates a fixed number of hours per job and assigns a unit price to each job. For jobs related to shipbuilding it is 9.6 RMB per hour, while for all other jobs it is 5.6 RMB per hour. If the job is completed within the allocated time to the required standard, workers will receive the full amount for the job (allocated hours per job times unit price) and can move on to the next job. The norm is for production workers to work 176 hours per month, but some work up to 250 hours per month.

(ii) & (iii) Experience and Skill Components: Each worker at Northern Shipbuilding receives 8 RMB per month for each additional year spent working for the firm. For University graduates, time spent studying at University is counted when calculating the experience component. There are five skill classifications in Northern Shipbuilding with skill subsidies ranging between 50 RMB per month and 320 RMB per month. The skill classification depends on formal qualifications and ability to pass a written exam.

(iv) Annual Bonus: Northern Shipbuilding uses three methods to decide the annual bonus. Under the first approach, CSIC sets an upper bound for the bonus to be paid to the General Manager of Northern Shipbuilding and the bonus for other staff is calculated according to their position wage weighting. A second approach is for the senior management group to decide the bonus at each level. A third approach, which has been used where the firm makes a profit, but performance is still mediocre, is to give a bonus of one month's position wage. If the firm makes a loss, as in 1997, no bonus is paid.

Following the debt-equity swap, the position wages of designing and technical staff as well as senior managerial staff in Northern Shipbuilding have increased due to upward adjustments to their coefficient bands. Wages in Northern Shipbuilding are now in the medium to high range for its location. Prior to adjusting their position wage, the firm lost some designing staff and production managers to foreign-owned companies. Most of these graduated from universities in the 1990s and were less influenced by traditional ties of firm loyalty. However, since the reforms to the position wage, designing staff in Northern Shipbuilding can now earn 2,500-3,000 RMB per month plus receiving a further 40 percent of their wage in social welfare benefits. Taking social welfare benefits into account, this amount is roughly comparable to foreign-owned companies where the monthly wage is about 4000-5000 RMB per month. Given that SOEs, such as Northern Shipbuilding, have more flexible working arrangements than foreign-owned firms, since the wage reforms some designing staff have even returned to the firm.

As discussed above, since 1995 Northern Shipbuilding has come increasingly to rely on outsourcing teams. There are two methods of

compensating outsourcing teams in Chinese shipyards.<sup>33</sup> The first arrangement, common in Guangzhou, is that the shipyards pays 80 RMB per worker per day to the team leadership, making the effective monthly wage for a team worker 2400 RMB. Of this amount, the team leadership passes on 1400 RMB per month to the team workers, retaining the rest as profit. The second arrangement, used in Northern Shipbuilding, is for the firm to pay a lump-sum to the team leadership based on cost, which is negotiated between the parties and it is up to the team leadership to allocate the lump-sum between team members. For example, for block assembling, Northern Shipbuilding pays teams 400-500 RMB per ton. In a block there are 80-100 tons. Therefore, the firm pays a lump sum to the team of 40,000-50,000 RMB. Under both arrangements, the team leadership is responsible for meeting all social welfare commitments to the team members and is responsible for the standard of the work. The team leadership also has to pay all taxes such as income tax and value-added tax.

### *Separation of Production and Service Companies*

The work units in Northern Shipbuilding were separated into production and service companies in 1997 and the first half of 1998.<sup>34</sup> At Northern Shipbuilding there are two kinds of service companies. These are (i) companies with independent accounting arrangements, which are responsible for their own profit and loss and (ii) companies with internal accounting arrangements, which are not capable of surviving in the market on their own. Northern Shipbuilding has three service companies with independent accounting arrangements. These are a transport company (separated in 1997), and a welding factory and a general service company, (both separated in 1998). When the separation occurred 250 workers were transferred to the transport company, 200 workers were transferred to the general service company and 150 workers were transferred to the welding factory, although some have since transferred back – see below.

The major business of the transport company is road freight transport. It also has supplementary businesses in lifting, loading and installation equipment. When the transport company was established, Northern Shipbuilding recalled all vehicles that were used within the firm and transferred them to the transport company. If the work units within Northern Shipbuilding need a vehicle or heavy equipment they now hire it from the transport company at market rates. The transport company is also encouraged to hire out some vehicles to other companies, such as those used in construction, that Northern Shipbuilding does not use anymore. This has cut down transportation costs and increased the utilization rate of vehicles with estimated savings of seven million RMB.

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<sup>33</sup> Informant 1.

<sup>34</sup> Information in this section and the next section is from informant 1 and document 16 supplied by Northern Shipbuilding, October 2002.



The major business of the general service company is ship repair and installation and repair of marine equipment. It has a host of supplementary businesses including manufacture of ship parts and machine repair. The major business of the welding factory is producing welding sticks with supplementary businesses producing welding string, welding powder and small metal repairing. Originally when it was separated the welding factory was not market-oriented. As a result, Northern Shipbuilding was forced to reduce its staff from 150 to 70 with the other 80 transferring back to the production company. However, with the reduction in its labour force, it is now making a profit.

Northern Shipbuilding has three service companies with internal accounting arrangements. These are marine transport, panel services and ship body services companies. The core business of the panel services company is installing panel framing in ships; however, it has diversified into plastic laminating. In the past Northern Shipbuilding got outside contractors to do the plastic laminating on piping installed in its ships, but it now subcontracts this work to the panel service company. The ship body services company has 200 workers, who were mainly laid-off from work units for poor performance. In an attempt to make these workers perform to a higher standard Northern Shipbuilding has given the ship body services company a block contract and told them that if the contract is not met their ties with the firm will be severed.

#### *Separation of Social Welfare Functions*

(i) Hotel: Northern Shipbuilding owns a hotel, which it built for 30 million RMB between 1995 and 1997. The hotel was losing 1 million RMB per annum. In 2000, it was merged with the marine transport service company. The reason for the merger was that the hotel was loss making, while the marine transport company was profitable.

(ii) Bus Route: Northern Shipbuilding established a bus route in 1990 because there was no public transport for workers to get to the firm. Northern Shipbuilding had to transport 3000 workers between the hours of 7 am and 7.45 am which required 20 to 30 buses. Northern Shipbuilding thought that it could recoup some of the costs through charging workers a fare and running the bus service at other times of the day. It was making a loss of 900,000 RMB per annum and in 1999 it was transferred to the municipal government.

(iii) Childcare Centre and Kindergarten: Northern Shipbuilding operated a childcare centre in the factory and a kindergarten in the residential area for use by its employees. The cost to the firm of offering these services was 500,000 RMB per annum. These were closed in 1995-96 and, as compensation, Northern Shipbuilding introduced one year paid maternity leave (without annual bonus), which has proved to be a cheaper option.

(iv) Junior Secondary School: Northern Shipbuilding is negotiating with the

municipal government to separate its junior secondary school. The problem is that the municipal government wants the firm to transfer all of the school's assets, make an initial lump-sum payment of 6 million RMB and pay an annual subsidy starting at 1.2 million RMB to be phased out over 10 years. The employees of Northern Shipbuilding are also opposed to transferring the school because it is currently a good quality junior secondary school with a high proportion of students gaining access to "key" secondary schools.

## Conclusions

China represents a successful latecomer in shipbuilding, but it still lags behind Japan and South Korea. Initially we examined the transformation of the shipbuilding industry in China over the last two decades. In the second part of the article, the growth path and restructuring of Northern Shipbuilding was used to illustrate China's approach to reforming its shipbuilding sector. Northern Shipbuilding is typical of many large SOEs and its experience provides some insights into the state-owned sector in China.

The first point to note is that its growth path, in fits and starts, reflects other large SOEs. The emphasis on maximising output in Northern Shipbuilding up to the mid-1990s was similar to managers in SOEs in other industries. For example, writing about the iron and steel industry in the early-to-mid-1990s Steinfeld (1998: 174) writes: "Shougang's officials seemed motivated by the same managerial goals that prevailed industry wide: in essence managers sought to maximize output. As one former Ministry of Metallurgical Industry Cadre explained, the tried-and-true measure of performance in Chinese industry – whether at Angang, Magang, Shougang, or any other large firm – is output growth". Similar chaotic production to Northern Shipbuilding was observed in these industries.

Second, Northern Shipbuilding has followed the approach of many large SOEs in China, and many late-industrializing large conglomerates in East Asia more generally, and attempted to trade up the product cycle. This is most evident in its response to the Asian financial crisis. Since 1998, its profits and sales have been falling, but it has been entrepreneurial in addressing the challenges of the Asian financial crisis, predominantly through related diversification into marine engineering equipment. Recent reforms have started to see the separation of production and service companies and the transfer of "non-productive" social welfare activities to local government. Whether diversification is the best strategy in the light of the perceived failure of similar strategies in Japan and South Korea is hotly debated in the literature. This debate has intensified since the Asian financial crisis (Smyth 2000; Nolan and Zhang 2002). However, paradoxically, rather than being deterred by the outbreak of the Asian financial crisis, it is precisely in the years 1998-2000 that the Chinese government's *zhuada* policy made considerable headway in promoting large enterprise groups and firms made the most progress in trading up the product cycle consistent with the late industrialization paradigm.

Third, the major problem facing Northern Shipbuilding as with most large SOEs in China is what to do with its surplus workforce. While firms such as Northern Shipbuilding maintain such large numbers of surplus workers, it is difficult for them to catch-up to their more efficient Japanese and South Korean competitors. However, this does not mean that the answer is for large SOEs to lay-off large numbers of surplus workers over night. Suggestions along these lines are naïve and fail to recognise the complexities of the social dimension of reforming China's SOEs. The reforms in Northern Shipbuilding, though, do provide some insights into how large SOEs are striving to improve their competitive position. The response has been to promote market-oriented reforms inside the firm, such as managerial and wage reforms, which create the right incentives, to divest the firm of loss-making non core businesses and slowly downsize employment in core operations. The challenge for Northern Shipbuilding, and other large SOEs, is to continue to promote such policies at a crucial period for economic restructuring. If China's shipbuilding companies are able to do this, its shipbuilding industry will be able to continue with the remarkable progress it has made over the last two decades.

## References

- Amsden, Alice (1989) *Asia's Next Giant: South Korea and Late Industrialization*, (New York: Oxford University Press).
- Armitage, Catherine (2003) 'China's "Iron Rice Bowl" Gets the Chop', *Australian* (Sydney) January 13, p. 12.
- British Embassy (2002) 'China's Shipping: Update 2002', British Embassy, Beijing, July 31.
- CD (2003) 'Death Knell of Life-Long Tenure', *China Daily*, January 7.
- Chen, Aimen (1995) 'Inertia in Reforming China's State-owned Enterprises: The Case of Chongqing' *World Development*, 26(3): 479-495.
- Chen, Xiaojin (2001) 'China's Shipbuilding Giant Receives 136 New Orders', *Asiainfo Daily China News* (Dallas) December 31.
- Cheung, Tai Ming (1991) 'Yards of Expansion: China's Shipbuilders are Trying to Go Up-Market', *Far Eastern Economic Review* 151(6): 52.
- Child, John (1994) *Management in China During the Age of Reform*, (Cambridge: Cambridge University Press).
- Choe, C. and X. Yin (2000) 'Contract Management Responsibility System and Profit Incentives in Chinese State-owned Enterprises', *China Economic Review* 11: 98-112.
- Daewoo Securities (2001) "Shipbuilding Sector – Industry Update, Earnings Results in 1Q01 and Forecast" <http://www.securities.co.kr/newhome/en/analysis/PDF?BriefD10517.ship.pdf>
- Development Research Centre (DRC) (2001) 'The Gains will Outweigh the Losses for the Shipbuilding Industry with China's Accession to the WTO', <http://drcnet.com.cn>, July 29.
- EEC (2000) *Second Report from the Commission to the Council on the Situation in World Shipbuilding*, (Brussels: EEC).

- EEC (2002) *Fifth Report from the Commission to the Council on the Situation in World Shipbuilding*, (Brussels: EEC).
- Frenkel, S. and S. Kuruvilla (2002) 'Logics of Action, Globalization, and Changing Employment Relations in China, India, Malaysia, and the Philippines', *Industrial and Labor Relations Review*, 55 (3): 387-412.
- Groves, T, Y. Hong, J. McMillan and B. Naughton (1994) "Autonomy and Incentives in Chinese State Enterprises", *Quarterly Journal of Economics*, 109(1): 183-209.
- Guillen, M (2000) 'Business Groups in Emerging Economies: A Resource-Based View', *Academy of Management Journal* 43(3): 362-380.
- Han, Caizhen (2002) 'Shipbuilding Industry's Opportunities, Challenges and Countermeasures with China's Accession to the WTO', <http://drcnet.com.cn>, July 29.
- Huang, Langhui, Wu Zhonghua and Yao Yumin (1998) 'Bai hu shidian zhidu chuangxin chengxiao xianzhu', *Modern Enterprise Herald* No. 1: 35-39.
- Hugar, Wayne (2001) 'Is China Taking a Great Leap Forward in Shipbuilding?' *United States Naval Institute Proceedings* 127(7): 82-84.
- JJRB (2001) 'The Largest 50 State Key Enterprises in Terms of Sales Revenue in 2000', *Jingji Ribao (Economic Daily)*, August 8: 2.
- Kuehl, J and G. Sziraczki (1995) 'Employment Restructuring at the Micro-level: Results of the Dalian Pilot Enterprise Survey' in L.L. Lim and G. Sziraczki (eds) *Employment Challenges and Policy Responses: Chinese and International Perspectives*, (Beijing: International Labour Office, Area Office, Beijing).
- Lee, Tae-Woo (1999) 'Restructuring of the Economy and its Impacts on the Korean Maritime Industry', *Maritime Policy and Management* 26(4): 311-325.
- Liu, Shaojia Guy (2000) 'How Will China's Large Industries Fare, Once China Enters the WTO', *EAI Background Brief* No. 73.
- Lo, Dic (1997) *Market and Institutional Regulation in Chinese Industrialization, 1978-94* (London: Basingstoke).
- Lo, Dic (1999) 'Reappraising the Performance of China's State-owned Industrial Enterprises, 1980-96', *Cambridge Journal of Economics* 23: 693-718.
- Lo, Dic (1999a) 'China in the Mirror of East Asia: Economic Transformation at the Crossroads', Manuscript, Department of Economics, SOAS, University of London.
- Lu, Han (2002) 'When Will Shipbuilding Enter the 'First Class' of the World?' *Jingji Ribao (Economic Daily)* May 9.
- Lu, Boa Zhang and Alan Tang (2000) 'China Shipbuilding Management Challenges in the 1980s', *Maritime Policy and Management* 27(1): 71-78.
- McNally, Christopher and Peter Nan-shong Lee (1998) 'Is Big Beautiful? Restructuring China's State Sector Under the *Zhuada* Policy', *Issues and Studies* 34(9): 22-48.
- Moore, Thomas (2002) *China in the World Market: Chinese Industry and International Sources of Reform in the Post-Mao Era*, (Cambridge: Cambridge University Press).

- Morris, Jonathan, Jackie Sheehan and John Hassard (2001) 'From Dependency to Defiance?' Work-unit Relationships in China's State Enterprise Reforms', *Journal of Management Studies* 38(5): 697-717.
- Murray, Geoffrey (2001) 'China's Largest Shipyard Formed by Merger in Shanghai', FBIS, April 13.
- Nolan, Peter (1996) 'Large Firms and Industrial Reform in Former Planned Economies: The Case of China', *Cambridge Journal of Economics* 20: 1-29.
- Nolan, Peter (2001) *China and the Global Business Revolution*, (London: Palgrave).
- Nolan, Peter (2002) 'China and the Global Business Revolution', *Cambridge Journal of Economics* 26: 119-137.
- Nolan, Peter and Wang Xiaoqiang (1998) 'Beyond Privatization: Institutional Innovation and Growth in China's Large State-owned Enterprises', *World Development* 27(1): 169-200.
- Nolan, Peter and Godfrey Yeung (2001) 'Big Business with Chinese Characteristics: Two Paths to the Growth of the Firm in China Under Reform', *Cambridge Journal of Economics* 25: 443-465.
- Nolan, Peter and Jin Zhang (2002) 'The Challenge of Globalization for Large Chinese Firms', *World Development* 30(12): 2089-2107.
- Qiu, Zeqi and Zheng Yongnian (1998) 'Xiangang and its Sociological Implications of Reducing Labour Redundancy in China's SOEs' in Wang Ganwu and John Wong (eds) *China's Political Economy* (Singapore: Singapore University Press).
- Rawski, Thomas (1999) 'Reforming China's Economy: What Have We Learned?' *China Journal* 41: 139-156.
- Research Group, the Industrial Economy Research Institute, Social Science Academy of China (1997) 'Chinese Industry's Change from Quantity Expansion to Quality Expansion', *Chinese Industrial Economy* 111, 5-14.
- RMRB (2001) 'China's Shipbuilding Giant Reduces Losses, *Renmin Ribao* (People's Daily) January 12: 3.
- Scherer, Frederic and David Ross (1990) *Industrial Market Structure and Performance*, (Boston: Houghton, 3<sup>rd</sup> edn).
- Shieh, Shawn (1999) 'Is Bigger Better?' *China Business Review* May-June 50-54.
- Shirk, Susan (1993) *The Political Logic of Economic Reform in China* (Berkeley: University of California Press).
- Smyth, Russell (2000) 'Should China be Promoting Large-Scale Enterprises and Enterprise Groups?' *World Development* 28(4): 721-737.
- Smyth, Russell and Zhai, Qingguo (2002) 'Equity for Debt Swaps in China's State-owned Enterprises: A Property Rights Perspective', *China Information* 16(1): 1-24.
- Smyth, Russell and Zhai Qingguo (2003) 'Economic Restructuring in China's Large and Medium-sized State-owned Enterprises: Evidence from Liaoning', *Journal of Contemporary China* 12(34): 173-205.
- Smyth, Russell, Zhai Qingguo and Hu Wenguo (2001) 'Restructuring of China's Petrochemical Enterprises – A Case Study of the Fushun Petrochemical Company' *Post-Communist Economies* 13(2): 243-261.

- Steinfeld, Edward (1998) *Forging Reform in China: The Fate of State-owned Industry*, (Cambridge: Cambridge University Press).
- Steinfeld, Edward (2001) 'China's Program of Debt-Equity Swaps: Government Failure or Market Failure?' Paper Presented at a Conference on Financial Sector Reform in China, September 11-13, John F. Kennedy School of Government, Harvard University.
- Sutherland, Dylan (2001) 'Policies to Build National Champions: China's 'National Team of Enterprise Groups' in Peter Nolan *China and the Global Business Revolution* (London: Palgrave).
- Tian, Jane (2001) 'Shipyards Merger to be Stronger', *Shanghai Star* August 29.
- United States International Trade Commission (1992) *Shipbuilding Trade Reform Act of 1992*, (Washington DC: United States International Trade Commission).
- Xinhua (2000) 'Long Term Sales Outlook for PRC Shipbuilding Industry', FBIS, May 22.
- Xinhua (2000a) 'China's Shipbuilding Industry Plans More Sales', Xinhua News Agency May 22.
- Xu, Xiang (2001) 'Challenges Faced by China Shipbuilding Industry' *China Shipbuilding Information*  
<http://www.csscinfo.com.cn/csscin/gnxw/zclt2990.htm>.
- Yao, S. (1997) 'Profit Sharing, Bonus Payments and Productivity: A Case Study of Chinese State-owned Enterprises', *Journal of Comparative Economics*, 24, 281-296.
- Yu, Shichun (2001) 'Impacts of China's Accession to the WTO on the Shipbuilding Industry',  
<http://210.79.232.200/trsweb/Detail.wct?SelectID=6697&RecID=35>.
- Zhang, Jiaguo (2002) 'Shipbuilding Industry: The Outpost of China's Accession to the WTO', DRC July 29, <http://www.drcnet.com.cn>.
- Zheng, Rongsheng (2001) 'Reinforcing the Industrial Administration and Developing China's Shipbuilding Industry in the 21<sup>st</sup> Century', Development Research Centre <http://www.drcnet.com.cn> July 29.
- Zhongguo daxing qiye nianjian (ZDQN) (various) (Chinese Large and Medium-Sized Enterprises Yearbook) Beijing: China Statistical Press.