Shipbuilding and Ship Repair Workers around the World

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China, Philippines, Singapore, Taiwan, and Vietnam

Hugh Murphy

This short chapter is limited in that up-to-date information on shipbuilding and repair in the five countries examined is difficult to obtain and scholarly output in English is fragmented to say the least.1 Two countries, China and Vietnam, are avowedly communist, while Singapore is a semi-authoritarian sovereign city-state with a unicameral parliament and is now an advanced industrial country.2 Taiwan, officially the Republic of China, is a multi-party advanced industrial democracy with universal suffrage, but since 1949 has not been recognised by mainland China as an independent state.3 The Philippines is a constitutional republic with a presidential system and a bicameral legislature. What the five countries have in common is


2 The People’s Action Party have been in control of the Singaporean parliament since self-governance was secured from Malaysia in 1959. Trial by jury was abolished in Singapore in 1970; all public gatherings of five or more people require police permits; and protests may be legally held at only one location.

3 The Republic of China (ROC) was established in China in 1912. In 1945, Japan surrendered Taiwan to ROC military forces on behalf of the Allies. Following the Chinese Civil War, the Communist Party of China took full control of mainland China and founded the People’s Republic of China (PRC) in 1949. The ROC relocated its government to Taiwan, and its jurisdiction became limited to Taiwan and its surrounding islands. In 1971, the PRC assumed China’s seat at the United Nations, which the ROC had originally occupied. International recognition of the ROC has gradually eroded as most countries have switched recognition to the PRC. Only twenty-one small UN member states currently maintain formal diplomatic relations with Taiwan. The USA maintains unofficial diplomatic relations with Taiwan but does not recognise the PRCs claim to sovereignty over it.
that all came late to industrialisation, with Singapore and Taiwan, with relatively small populations, being exemplars of rapid economic growth and consumerism, and China and Vietnam, with no hint of irony from their spectacularly corrupt rulers, and provincial and local governments, instigating market-led reforms more in tune with capitalism rather than communism. All five countries had lower shipbuilding labour costs than the market leaders, South Korea and Japan – significantly so in the case of China and Vietnam – but lagged in productivity.\(^4\) Factor-cost advantages in the cost of labour are often only fleetingly advantageous and relatively unsophisticated measures of competitive ability. Companies tend to employ more sub-contracted non-unionised labour over time as a means of keeping costs down. China, with its huge pool of internal migrant labour, is an exemplar of this practice.

The People's Republic of China

From 1949 onwards China's shipbuilding industry was initially fostered by its communist government to attain self-sufficiency in naval and mercantile shipbuilding. Shipbuilding was seen as a strategic industry in upgrading China's military capability, driving its economic growth and as a catalyst for the development of its iron and steel industries, and electronic and machinery manufacturing plants. On the military side, Soviet-designed conventional diesel submarines were built in series, but the split in Soviet-Sino relations from the early 1960s onwards hit the Chinese shipbuilding industry hard: only two ships were built in 1961, one in 1962, and none at all in 1963.\(^5\) With self-sufficiency now embarked upon by the Ministry of Shipbuilding, annual output by 1970 had almost reached 500,000 grt. This amount of tonnage was substantially aided by orders from the China State Shipping Corporation (COSCO) founded in Beijing in April 1961. However, self-sufficiency aside, only from 1975 onwards did China turn to export

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4. In the widest sense, the shipbuilding industry increases productivity by incorporating process enhancements or through modernisation, or by a combination of both. Process improvements include any changes that affect employee training in time and quality, quality control, and manufacturing flows. As shipbuilding involves a complex production process, the level of efficiency (and therefore costs) can vary considerably from one yard to another. Material costs and availability are significant factors, and the aim of any aspiring shipbuilding country is to have as much of the process as possible under its control and manufactured domestically, from steel to main and auxiliary engines, cranes, and other shipbuilding equipment.

markets in order to make its shipbuilding industry internationally competitive and to earn foreign currency; subsequently, in 1982, shipbuilding output broke the 1 mgt barrier for the first time.\(^6\)

In this China had a distinct factor-cost advantage in wages over the vanguard of late industrialising countries (LICs), but not their experience in the export market for ships.\(^7\) China’s cost advantage in wages was, however, tempered by the relative backwardness of its shipyards in terms of technology and product. Early attempts at the export market emanating from China’s “Open Door” policy of 1978 were bedevilled by poor-quality ships, low levels of productivity, late deliveries, and poor-quality management controls and financial accounting, and were exacerbated by poor credit terms in relation to competitors.\(^8\) These problems persisted, and as the Chinese economy boomed in its later liberalisation period, retention of manpower became acute. Another problematic area was the escalating costs of importing materials, which ate into hard-currency reserves. From 1983 onwards, however, the Bank of China became more involved in financing export credits. Nevertheless, up to 1985, only one Chinese shipyard, Dalian, with British assistance in modernising its facilities,\(^9\) had the capacity to construct ships up to 100,000 grt. Chinese shipyards concentrated largely on bulk carriers and smaller container ships, but had also moved into chemical and product tankers.\(^10\) Although the lack of large-capacity building docks effectively ruled China out of the large VLCC market for some time, the situation had changed by the end of the 1990s, by which stage Dalian had the capacity to build VLCCs up to 300,000 dwt.

Earlier, in 1980, the China State Shipbuilding Corporation (CSSC) had been set up to co-ordinate shipyards and to encourage exports. By this stage, China’s gross domestic product was growing by an annual average of

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\(^6\) China’s 1982 output equalled 1,024,500 grt. Unless otherwise stated all tonnage figures are from Lloyd’s Register of Shipping Annual Returns.

\(^7\) Todd, Industrial Dislocation, 214. Todd, citing an article in Business Week of 28 June 1988, notes that average monthly wages in China in 1988 equalled USD $40 in contrast to USD $547 in Singapore, USD $598 in Taiwan, and USD $633 in South Korea.


\(^9\) From the nationalised British Shipbuilders Plc, in 1982.

\(^10\) For this market, see Murphy and Tenold, “Strategies, Market Concentration and Hegemony in Chemical Parcel Tanker Shipping”. 
just under 10 per cent. By a combination of guaranteed demand in building up its domestic fleet to meet the growing requirements of international trade, increased investment, and export promotion, China’s shipbuilding output had by 1985 reached its highest level to that date of 2,219,400 grt. In that year Chinese shipyards delivered around 0.9 per cent of all vessels globally. Since then, year on year, China has increased its market share in parallel with its accelerated economic growth, and by 2010 had entrenched its position as the leading volume shipbuilding nation in the world with a market share of around 37 per cent. Today, China is the world’s largest ship producer with around 40 per cent of the global market.

A major reorganisation of Chinese shipbuilding occurred in 1999, when the state-owned shipbuilding industry was split into two groups operating independently from each other; one remained the China State Shipbuilding Corporation (CSSC) while the other became the China Shipbuilding Industry Corporation (CSIC). The CSSC and CSIC are both large, state-owned enterprises under the direct supervision of the State Council and control some 70 per cent of Chinese shipbuilding output. CSIC’s affiliated shipyards are mostly located around Dalian in northern China in the region of the Gulf of Bohai. CSSC retained the balance of facilities and activities and continued as a large conglomerate and state-authorised investment institution, directly administered by the Chinese central government. CSSC controls some sixty sole-proprietorship enterprises in addition to research and design institutes and marine-related equipment manufacturers and trading firms in China. Its shipyards are principally located around the east coast of the Yangtze River delta and southern regions of China. Following on from this reorganisation, foreign partnerships and joint ventures on the basis of no more than a 49 per cent stake for the foreign enterprise were allowed as a way of modernising the industry and introducing more foreign technology and know-how. Foreign shipbuilders benefit from China’s relatively low-cost labour pool, and their presence in China in part offsets rising competition from Chinese shipbuilders. Singaporean shipbuilding and repair companies have established joint ventures in China, and major shipbuilders from Japan and South Korea have likewise entered the Chinese market through minority-stake joint ventures.11

11 Although it was possible for foreign shipbuilders to hold majority stakes in Chinese shipyards prior to 2006, the regulations were reinforced to limit participation in September 2006, again restricting foreign companies to 49 per cent shares in Chinese shipyards, diesel engine, and crankshaft manufacturing enterprises. Japanese shipbuilders in China include Tsuneishi Heavy Industries at Zhoushan and Kawasaki Heavy Industries at Nantong Cosco/KHI. The South Korean Samsung Heavy Industries has ship block-fabrication units at Ningbo
This top-down reorganisation of its shipbuilding and marine-engineering resources and China’s accession to the World Trade Organization (WTO) in 2001 further promoted the country’s integration into the global trade system, which has helped it to sustain economic growth, increase domestic purchasing power, and become the world’s leading exporter. Indeed, the Chinese shipbuilding industry experienced considerable expansion, and from 2000 onwards its yearly output outstripped that of all European Union countries combined, and its market share tripled, firmly entrenching China’s position as one of the top three players in the global market.

Statistics compiled by Commission of Science Technology and Industry for National Defence (COSTIND) show that in 2005 there were more than 2,000 shipbuilding companies in China, employing a workforce of around 400,000, of which 315,000 were employed by the 480 largest companies. However, it is likely that only 500 or so shipyards are capable of building ocean-going tonnage, and the number of yards capable of exporting their product is commensurately much less.

With the ongoing effects of the world financial crisis of 2008, Chinese shipyards faced the harsh reality of a downturn in demand, and the time-worn tendency of shipowners to cancel contracts and/or seek compensation on the basis of late-delivery clauses in contracts. This was particularly the case with China’s then largest privately owned shipyard, Rongsheng Heavy Industries at Nantong. Chinese banks rushed to finance shipbuilding after the 2008 global financial crisis as Beijing pushed easy credit and tax incentives to lift the industry and sustain industrial employment levels in the face of falling exports. Fees generated to banks by offering guarantees to shipbuilders were tempting until massive overcapacity – not just in Chinese shipyards – and falling demand started taking a toll on the yards around 2010. This led to a large degree of bank indebtedness as orders dried up and contracts were cancelled.
Indeed, the relationship between the banks and the Communist Party in China is at best hazy. Enforcing legal contracts is notoriously difficult in China, especially with state-owned enterprises that can use political pressure as leverage. In the case of Ronsheng, the party’s policy of encouraging private enterprise could be severely tested. Ronsheng came on-stream in 2007 and at its height employed nearly 28,000 workers. At that point it could be stated that it was too big to fail and, if it had done, the reputational damage to Chinese shipbuilding in foreign ship-owning firms would have been severely dented. Ronsheng employs fewer than 5,000 workers, and by July 2013 a small town, Changquingsha, built next to the shipyard, is all but empty and decrepit.\(^{14}\) Ronsheng posted a net loss of USD $1.4 bn in 2013 and is issuing bonds to remain in business. Currently, cancellation of orders by foreign shipowners has forced Ronsheng to cut production.\(^{15}\)

According to Thorsten Ludwig and Jochen Tholen, the All-Chinese Confederation of Trade Unions (ACTU), founded in 1925, represents not only the rights of the employees in state-owned enterprises (SOEs) and (since 2001) in private companies and joint ventures, but also the interests of migrant workers. That it can do so is obviously inherently contradictory. Historically, the members’ base of ACTU lay in the state enterprise sector. Setting aside COSTIND’s 2005 estimate for the entire industry, accurate figures of workers employed in Chinese shipbuilding and repair are difficult to obtain, but it is reasonable to speculate that the numbers employed by CSSC and CSIC alone hover just above 250,000 employees, with the vast majority being sub-contracted or temporary migrant workers, with financial support from the state for union administration being limited. Chinese workers have no legal rights to strike, and wildcat strikes are severely punished. Enterprise-related wage agreements in SOEs dominate: before 2004 labour laws were passed simply by the government or by the Chinese Communist Party by decree. From 2004, however, permanent employment contracts have been

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\(^{14}\) BBC News, 15 July 2013.

\(^{15}\) Bloomberg News, 31 July 2014.
replaced by time-limited contracts with only restricted protection against unlawful dismissals.\textsuperscript{16}

Chinese shipyards, after steep learning curves, have now begun to produce sophisticated tonnage. China’s first LNG carrier, \textit{Dapeng Sun}, was delivered in April 2008, despite being launched from the Hudong-Zhonghai shipyard in Shanghai in December 2005. Chinese shipbuilding’s first ultra-large 10,000-TEU container ship, \textit{CSCL Spring}, was delivered to China Shipping Lines at Dalian shipyard on 8 January 2014, while in May 2014 another 10,000-TEU container ship, \textit{Hanjin Buddha}, was delivered to the American Seaspan Corporation by Jiangou New Yangzi shipyard. China also announced in January 2014 that it would build its second aircraft carrier.\textsuperscript{17}

What is evident in Chinese shipbuilding, particularly after the global financial crisis of 2008, is that there is overcapacity relative to demand, and that this is particularly the case with private shipyards, many of which are in trouble.\textsuperscript{18} From 2002 to 2010, the number of shipyards with a production capacity of 300,000 dwt or above increased from five to thirty-three, while the number of yards with a capacity of 100,000 dwt or above surged from thirteen to fifty-nine. The number of shipyards in China at 2013 has swollen to more than 1,600, of which 60 per cent were built after 2001. Moreover, at August 2013, the combined profits of eighty major shipbuilders monitored by the Chinese Association of the National Shipbuilding Industry fell by 53.6 per cent in the first half of the year to 3.58 bn yuan (USD $584.1 mn), while business revenues plunged 18.5 per cent to 120.3 bn yuan (USD $19.66 bn). This led the party to express its concern over the path of the shipbuilding industry; on 4 August 2013 it issued a three-year support plan, which included control of capacity, upgrading shipbuilding standards, and the development of higher value-added products.\textsuperscript{19}

\textsuperscript{16} Ludwig and Tholen, “Shipbuilding in China and Its Impacts on European Shipbuilding Industries”.

\textsuperscript{17} Daily Telegraph, 19 January 2014. The first was \textit{Liaoning}, a Soviet-era aircraft carrier purchased from Ukraine in 1998 and refitted at Dalian shipbuilding.

\textsuperscript{18} For example, the Hengfu Shipyard, situated in east China’s Zhejiang province, had an annual production capacity of 1 mn dwt. However, Hengfu declared bankruptcy in 2011 due to a lack of orders and mounting debts. Zhejiang province is clustered with many shipbuilders operating within private shipyards. But since 2009, many of them have gone bust, like Hengfu. Although government-backed shipyards have on the whole fared better, the CSSC Jiangnan Heavy Industry Co. Ltd, one of the top five state-owned shipyards in China, posted a loss of 60.31 mn yuan (USD $9.85 mn) in the first half of 2013, while its business revenue plunged 39.49 per cent year on year. In 2012, the company registered a loss of 97.37 mn yuan (USD $15.91 mn). See BeijingReview.com.ch, No. 34, August 2013 (accessed 1 June 2014).

\textsuperscript{19} Ibid.
In today’s shipbuilding markets there is an increasing focus on design and build quality. Chinese shipbuilding largely still concentrates on lower value-added tonnage and has a long way to go to catch up on South Korean, Japanese, and – in the case of large offshore structures – Singaporean competition.\(^2\) Given the increasing importance placed on military construction in China as it builds up its navy, it is likely, first, that the greater technological content and production standards of these vessels will have spill-over effect on China’s merchant shipbuilding sector, where the better-capitalised state yards will increasingly concentrate on high-end ships and, secondly, that there will be a concomitant concentration of shipyards through bankruptcies or mergers capitalised to build them.

The Republic of the Philippines

Today, the Philippines, the world’s second-largest archipelago, is the fourth-largest global shipbuilding nation.\(^2\) Shipping is the conduit of the vast majority of Philippine domestic and international trade, and the efficient transport of goods and services across its vast chain of islands is a *sine qua non* for Philippine economic development, much of which has been foreign-led. The country’s rise to international shipbuilding prominence in a relatively short period is almost entirely due to state promotion of conditions conducive to foreign direct investment (FDI). This, in turn, has propelled the export growth of Philippine-built ships in the international market, particularly large bulk carriers, container ships, and passenger ferries.\(^2\) Blessed with readily available manpower and government willingness

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\(^2\) At the year to July 2013, for example, South Korean yards produced 76.2 per cent more than China by dollar value: *The Economist*, 23 November 2013.

\(^2\) *IHS Fairplay World Shipbuilding Statistics*, 2013, completions by country of build. There are 7,100 islands in the Philippine archipelago.

\(^2\) Importation of major raw materials such as steel plates has been liberalised since 1989. Shipbuilders located in special economic zones enjoy tax and duty exemptions. Under the investor-friendly Republic Act 9295 of 2004, passed to ensure the continued development of a viable shipbuilding industry, there is exemption from value-added tax on the importation of capital equipment, machinery, spare parts, life-saving and navigational equipment, steel plates, and other metal plates including marine-grade aluminum plates to be used in the construction, repair, renovation, or alteration of any merchant marine vessel operated or to be operated in the domestic trade. There are net operating loss carry-over provisions and accelerated depreciation. For projects registered with the Philippines Board of Investments there is an income-tax holiday of six years for those with pioneer status (greenfield shipyards) and four years for non-pioneer status. Any of the following may qualify for pioneer status: a shipyard operation with a minimum berthing capacity of 7,500 dwt or a project cost of at least the Philippine peso equivalent of USD
to promote shipbuilding and its ancillary industries, foreign companies such as South Korea’s Hanjin Heavy Industries shipyard at Subic Bay employ some 21,000 workers, overwhelmingly from non-unionised sub-contractors. Hanjin, which began building its shipyard on a 200-hectare greenfield site in Subic Bay in early 2006, launched the first container ship to be built in the Philippines in July 2008. The huge capacity of Hanjin’s dry dock in Subic, where four vessels can be built at a time, has resulted in faster production times and greater productivity. The Tsuneishi Cebu Shipyard, operated by Japan’s Tsuneishi Holdings Corporation since 1997, in partnership with Cebu’s Aboitiz Group, has produced some 182 ships at June 2014 on a 147-hectare site at Buanoy, Balambam, Cebu. The shipyard employs around 20,000 workers, mostly non-unionised sub-contractors.

The lack of trade union representation of overwhelmingly low-waged sub-contracted workers in Philippines shipyards has raised many health and safety concerns. Up to May 2014, thirty-seven workers have died in industrial accidents at Hanjin’s Subic Bay shipyard alone. There have been similar death tolls at the other shipyards.

The oldest foreign direct investment in Philippine shipbuilding started with the Singaporean conglomerate, Keppel, which began operating its shipyard in the Philippines in early 1994 with a capacity of twenty-eight vessels per year. It expanded its operation by fabricating tugboats and oil-rig hulls. Keppel now operates two shipyards at Subic (350,000-dwt capacity) and Batangas (50,000-dwt) and also undertakes ship repair and conversion with a full range of dry docks. Two notable smaller Filipino-owned shipbuilding companies are Herma Shipyard, Inc., of Mariveles, Bataan (established in 2000), which has recently gone into double-hulled petroleum tanker shipbuilding, and the older Colorado Shipyard Corporation of Consolacion, Cebu, established in 1972, which can build medium to large cargo ships. In addition, there are numerous ship repairing operations, which benefit from regulations that all Philippine-registered ocean-going ships have to be repaired Maritime Industry Authority (MARINA)-approved repair yards.

With its almost total dependence on large foreign-owned shipyards, the Philippines is vulnerable to political decisions made elsewhere. FDI...
can easily be advanced from abroad but it can just as easily be taken away. For labour, the largely sub-contracted workforce militates against greater unionisation, increases in wages, and improvements in terms and conditions of employment. The Philippine government’s promotion of FDI in shipbuilding has led to a largely successful industry in a relatively short period of time; whether that government can envisage a concomitant growth in wholly owned Filipino shipyards without massive subsidisation is another matter entirely.

The Republic of Singapore

Singapore’s ship repair industry began to develop only after its independence from the Malaysian Federation in August 1965. Its government clearly envisaged Singapore as Asia’s largest ship repair centre after Japan. Singapore’s shipbuilding capacity had earlier been enhanced by a 1963 joint venture between the Singapore Economic Development Board (EDB, which held 49 per cent) and IHI (Ishikawajima-Harima Heavy Industries) Japan (51 per cent) to create a shipyard, Jurong Shipbuilding, at Semulum Island, which also had a dry dock with a capacity of 45,000 dwt, later expanded to 90,000 dwt and a building dock capable of handling vessels of 1,500 dwt, later extended to 15,000 dwt. Jurong was envisaged as capable of constructing IHI’s Freedom class of cargo vessels.25 When the British withdrew from Singapore in 1971, its former naval base had already been reconverted under Singaporean government control as Sembawang Shipyard from 1 December 1968.26 Sembawang was owned by the EDB until it was publicly listed on the Singapore Stock Exchange and became a public listed company on 17 April 1973. From 1968 to 1978 Sembawang was managed on an agency basis by Swan Hunter (International) Ltd, of Newcastle upon Tyne in the north-east of England, to train local personnel to supersede it. Swan Hunter also had managerial responsibility until 1972 for the government-owned Keppel shipyard, previously operated by the Port of Singapore. Keppel became Keppel Shipyard (Pte) Ltd, on 23 August 1968, its first chairman being Mr

25 Todd, Industrial Dislocation, 161.
26 The Royal Navy’s Singapore Naval Base at Sembawang, which opened in 1939 at the then astronomical cost of £60 mn, covered 21 square miles and had the then largest dry dock in the world and the third-largest floating dock. Britain completed its withdrawal from Singapore in 1971. For the early history of the base and its long gestation, see McIntyre, The Rise and Fall of the Singapore Naval Base, and Neidpath, The Singapore Naval Base and the Defence of Britain’s Eastern Empire.
Hon Su Sen, then chairman of the EDB. The advent of Japanese FDI in Singaporean shipbuilding occurred in 1970 when Hitachi Zosen established the Hitachi Zosen Robin Dockyard (Pte) Ltd as a 50/50 joint venture with the Singaporean Robin Corporation. By October 1975 Robin Dockyard employed 1,021 workers, 98 pf whom were Japanese. From May 1973, Mitsubishi Heavy Industries, in a joint venture with a 51/49 per cent split with the Singaporean government, set up Mitsubishi Singapore Heavy Industries Ltd, and by 1975 the workforce totalled 500 workers inclusive of 59 Japanese. From January 1972, Singapore's shipbuilding and -repairing capacity was in the process of being further augmented by the construction at Sembawang shipyard of a 400,000-dwt capacity dry dock for VLCCs and ULCCs, officially opened by Singapore's prime minister, Lee Kuan Yew, on 25 May 1975.

Singapore's advantageous geographic position, its status as a major oil-refining centre, and its ability to anchor VLCCs in its deep-water port and to eventually accommodate VLCCs in dry docks led to an increase in employment. In 1971 some 18,000 workers were employed in shipbuilding and ship repair, with three large yards, Jurong, Keppel, and the specialist repairer Sembawang employing the majority of workers. Jurong completed a 300,000-dwt capacity repair dock in 1972. At its peak in 1974, shipbuilding and repairing employed 30,000 workers or 10 per cent of the island's manufacturing labour force.

With five major shipbuilding yards, Singapore's rise to prominence in shipbuilding and ship repair in a comparatively short space of time was remarkable and owed much to state promotion. Although there were lag effects consequent upon the OPEC price hikes of 1973-1974, the collapse of the VLCC market hit Singaporean shipbuilding hard; however, this was obviated by its ship repair sector and by an increasing concentration on off-shore rig construction and repair, which accounted for half of the industry's turnover in 1975. Another factor greatly affecting Singaporean shipbuilding competitiveness was the cost of importing many of its materials. Japanese
shipbuilders had a cost advantage on ship plate of 30 per cent, allowing them to undercut Singaporean yards’ prices by 60 per cent. Japanese encroachment into building smaller support vessels for offshore oil and gas activities had a deleterious effect on smaller Singaporean yards specialising in these markets. In recognition of this, the Singaporean government offered loans through the Singapore Development Bank for up to half the contract costs to induce domestic shipowners to build smaller ships up to 5,000 dwt in home yards.33

During the 1980s Singaporean shipbuilding faced many challenges, not least the inexorable rise of South Korea and the continued success of Japan. By 1985, Robin Dockyard had cut its workforce by two-thirds; it had abandoned shipbuilding altogether and pulled out of its joint repair venture with Hitachi Zosen; and Mitsubishi Singapore Heavy Industries had closed its giant repair dock. Ship repair rather than newbuilding again took centre stage with government support for rationalisation of facilities and aggressive price cutting making Singapore the cheapest centre for ship repair in the late 1980s. However, offshore construction work on mobile jack-up rigs, semi-submersible rigs, and floating production platforms became increasingly important in the 1990s as did consolidation of the industry to encompass two major groups, Keppel Fels and SembCorp Marine, the latter being a merger of Sembawang and Jurong in 1997. Both Keppel and SembCorp expanded their activities overseas following a “near market/near customer” strategy, and consolidated their individual Singaporean activities in shipbuilding, repair, and offshore work. On 17 July 2002, Keppel Corporation Ltd, through its offshore and marine division Keppel Offshore & Marine Ltd (Keppel O&M), acquired an 85 per cent stake and later on 19 August another 15 per cent stake in the Dutch offshore repair and conversion shipyard, Verolme Botlek, for a total consideration of €22.4 mn (S$38.3 mn). The purchase price was based on a willing buyer/willing seller basis but did not at that stage include the land and dry docks, which were leased from the Rotterdam Port Authority. The new company is known as Keppel Verolme BV.34 In addition to Keppel’s three Singaporean yards, Gul yard (3 floating docks and 3 berths), Benoi yard (2 dry docks of 300,000 and 170,000 dwt), and Tuas yard (3 dry docks of 400,000, 300,000, and 150,000 dwt), it also has Keppel Nantong 150 km north-west of Shanghai, and two shipyards in the Philippines. Keppel also

Keppel, 49 per cent Levingston). At first these yards built relatively unsophisticated jack-up rigs but progressed to semi-submersible rigs.

33 Tod, Industrial Dislocation, 163.
owns two Brazilian shipyards, Keppel BrasFels shipyard at Angra dos Rios, and Keppel Singmarine Navegantes at Santa Catarina. Keppel also owns an offshore yard on the Gulf of Mexico, Keppel AmFels at Brownsville, Texas. In May 2012, Keppel sold its Norwegian offshore yard at Sandnes to a Norwegian company, OneCo AS, and concentrated its European activity in Rotterdam.

SembCorp Marine is currently the major shipbuilder, ship repairer, and offshore rig and floating production builder in Singapore; its shipyards encompass Jurong Shipyard, Sembawang Shipyard, Sembawang Marine and Offshore Engineering (SMOE, producing offshore production platforms and floating production facilities), PPL Shipyard (producing mobile offshore jack-up and semi-submersible drilling rigs), and vessel repair company Jurong SML. It is planned to consolidate these enterprises at the new Sembmarine Integrated Yard at Tuas by 2024. The 73.3-hectare Phase 1 began operations on 5 August 2013, while yard development work continues on the other two phases at the 206-hectare site. SembCorp Marine, like Keppel, has expanded overseas. In addition to its Chinese joint venture with COSCO, it has a joint venture in India, Sembmarine Kakinada Ltd, and owns a shipyard in Brazil, Estaliero Jurong Aracruz, two fabrication yards in Indonesia, and an offshore rig repair, upgrading, and conversion yard on the Gulf of Mexico at Sabine Pass, Texas, acquired in 2005.

Singapore, despite increasing competition from Japan and South Korea and now China, has maintained its position as a major ship repair centre and offshore rig and floating production facilities supplier. Its record on delivery, unlike China’s, is good; and its two major firms continue to invest heavily to keep ahead of the competition.

Taiwan (Chinese Taipei)

In 2009, Taiwan had around 116 local shipyards, with 70 per cent being small (fewer than 50 employees), with the remainder being best characterised as small to medium in size, and with only one company, the China Shipbuilding Corporation, being large by international standards. Strikingly, in a capitalist-oriented economy, Taiwan’s modern shipbuilding industry was partly fostered by the state. Promoted on the classic nexus of

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35 At 2008, CSBC employed 2,780 on contract and 3,000 workers on sub-contracts: Industrial Development Bureau, Ministry of Economic Affairs, Chinese Taipei, and OECD Council Working Party on Shipbuilding (WP6), Shipbuilding in Chinese Taipei (2009). There is also a large yacht-building sector in Taiwan which employs around 5,500 workers.
steel, shipbuilding, and heavy machinery fostering economic growth and employment,36 Taiwan's shipbuilding industry was dominated by two large state enterprises, the Taiwan Machinery and Shipbuilding Corporation (TMSC) established in May 1946, and the China Shipbuilding Corporation (CSBC) established in July 1973.37 In April 1948, TMSC was split into two separate state-owned companies, Taiwan Machinery Corporation and Taiwan Shipbuilding Corporation (TSBC). The 1950s were characterised by very low annual output totals, reaching a total of only 23,178 gt in 1958. A year earlier, in February 1957, TSBC had leased its Keelung Shipyard to America Ingalls Taiwan Shipbuilding and Dry Dock Company on a ten-year contract basis, an arrangement which was to last only to September 1962, when TSBC again assumed control of its shipyards for the Taiwanese state. Thereafter, in accordance with state policy, the growth in Taiwanese shipbuilding was firmly linked to the expansion of the domestic shipping fleet, and its efficiency was strengthened by a technical co-operation agreement with the Japanese major IHI, which ensured that designs and materials (mostly imported) conformed to international standards. A new building dock of 100,000-dwt capacity capable of both building and repair was in operation at the northern port of Keelung by 1968, at which stage the largest vessel ever built in Taiwan, the tanker MV Yu Tsao, had been launched for the indigenous China Petroleum Corporation (CPC). This vessel joined two others in service both constructed in Japan by IHI, with another two on order to be built in Taiwan for CPC for delivery by March 1972.

With a giant dock of 1 mn-dwt capacity under construction at CSBCs shipyard at the southern port city of Kaohsiung, the OPEC crisis of 1973-1974 could hardly have come at a worse time for a government determined to make its mark on world shipbuilding output. Opened in 1976, the giant Kaohsiung Shipyard entered into production just as global shipping markets had contracted. Tankers taken on at fixed prices became serious loss-makers. The first of these, the ULCC Burmah Endeavour, of 450,000 dwt, then the world's third-largest ship, was launched at Kaohsiung in June 1977.

In response to the global downturn in shipping, the Taiwanese state launched a shipping-promotion scheme in 1977, which envisaged Taiwanese

36 Taiwan’s China Steel Corporation was formed in 1971 as a private company and finally opened its steel mill at Kaohsiung in 1977; in July of that year it became a state-owned company. Thereafter, it became a major supplier of steel plate to the local shipbuilding industry, and in April 1995 was reprivatised with the state retaining shares in the new corporation.

37 The first major shipbuilding company in Taiwan, initially founded in 1937 by Mitsubishi Heavy Industries Corporation during the Japanese colonial period, was the Taiwan Dockyard Corporation.
shipyards producing 43 vessels of 1.6 mn gt in 1981; in response to government stimulation of demand, TSBC and CSBC merged in 1978 under the banner of the latter. During the 1980s and thereafter, CSBC built a range of very large tankers and bulk carriers and increasingly concentrated on building cellular container vessels. This strategy was sensible and gave the yard prolonged work as the Taiwanese economy began to shift towards knowledge-based technological industries and services. In 2007 Taiwanese shipbuilding delivered a record-breaking 79.5 mn dwt of shipping and in 2008, just as the world financial crisis began to unfold, CSBC launched its largest container vessel to that date. In December 2008, following a cash injection to recapitalise CSBC, the Taiwanese state partially privatised the company through an initial public offer with the state retaining a 38.8 per cent share in CSBC. In the following year, Taiwan’s shipbuilding industry had suffered a 75 per cent fall in orders compared to 2008. Nevertheless more than half of the industry’s output by value came from CSBC alone. Given Taiwan’s limited capacity relative to China, South Korea, and Japan, it is hardly surprising that its indigenous shipping firms, in addition to ordering from CSBC, look to these countries to build their ships. A good example is the Evergreen Marine Corporation which in July 2012 received the first of twenty L-type container ships from Samsung Heavy Industries of South Korea for delivery by July 2014.

The ongoing effects of the 2008 financial crisis, with fuel prices and raw materials rising inexorably, have forced Taiwanese shipbuilders to design and develop more advanced multi-functional energy-efficient vessels that are faster and larger to meet higher demands from ship buyers. With just under 2 per cent of world completions in 2000, Taiwan accounted for 0.6 per cent in 2013.

Today, Taiwan occupies seventh place in world shipbuilding output. However, the signing of an Economic Cooperation Framework Agreement with the People’s Republic of China in June 2010 allowed certain business-owners

38 Three Taiwanese high-tech companies of note are ACER and ASUS, both multi-national hardware and electronics companies, and HTC, a smartphone and tablet manufacturer.
39 The first two container vessels built by CSBC, Ever Vital and Ever Vigor, were ordered in 1977 by Taiwan’s Evergreen Marine Corporation, now the world’s fourth-largest container ship operator. The container vessel launched in 2008 was the YM Utopia of 101,100 dwt, 8,240 TEU, and 333 m in length for the Yang Ming Marine Transport Corporation of Taiwan.
to gain from preferential or zero tariffs on trading activities between the two sides of the Taiwan Strait. This has been, and remains, highly controversial in Taiwan. Theoretically a functioning agreement could lead to higher demand for shipbuilding as a growing amount of goods are expected to be shipped between coastal cities in mainland China and Taiwan. The signing of a Cross Straits Services Trade Agreement in June 2013 is yet to be ratified in the Taiwanese legislature and has sparked mass demonstrations in Taipei.

The Socialist Republic of Vietnam

Since reunification in 1976, under Communist Party of Vietnam rule, the centralised economy of Vietnam has been beset by considerable problems in production in moving from a primarily agrarian to a late industrialising country. Imbalances in supply and demand, rampant inefficiencies in distribution and circulation, hyperinflation, and debt problems have hit Vietnam hard.42

However, with a coastline of more than 3,200 km, low labour costs, relatively developed domestic waterway transportation, and a large, relatively young, and literate workforce, Vietnam had considerable potential to develop its shipbuilding industry and to attract foreign investment. All the more so since 1986, when the communist leadership launched a political and economic renewal campaign, which embarked on reforms to facilitate the transition from a centralised economy to – without a hint of irony – a socialist-oriented market economy. This combined central planning through five-year plans with free-market incentives, and encouraged the establishment of private businesses and foreign investment, including foreign-owned enterprises to the extent of a 49 per cent ownership cap. The general development strategy known as doi moi (renovation) focused on three elements: agricultural development, macro-economic reforms, and trade liberalisation. Crucially, agricultural decollectivisation, the

42 Following the unification of North and South Vietnam in 1976, the communist government tried to extend the central planning model of development, with state ownership of industry and collective agriculture, to the more prosperous south, first by purging what remained of its former capitalist class. In 1978, the government imposed agricultural collectivisation on the southern peasantry, which met with strong resistance. This situation was aggravated by two factors: first, the dispatch of Vietnamese troops into Cambodia in 1978, leading to a cessation of Western aid; and, secondly, a border dispute with China in 1979, which led to the withdrawal of Chinese assistance. By 1980, Vietnam supported a large army in the field under conditions of severe foreign exchange shortage, falling production, and rising inflation.
abandonment of centralised pricing, and land reforms led to a surge in production and exports. Beforehand, there had been only limited efforts to encourage agricultural growth and to cut subsidies to state-owned enterprises, and successive efforts at currency reform had led to increases in the rate of inflation: from 166 per cent per annum from 1980 to 1985 to 371 per cent during the period 1986-1988.43

Vietnam had been a member of COMECON since 1978, and its economy was highly dependent on Soviet aid in the post-reunification decade. It is likely that the party leadership in Hanoi foresaw COMECON’s likely dissolution and planned to reorient its trade from the then Soviet Union and its allies, hence its policy post-1986 to liberalise trade, devalue its exchange rate to increase exports, and embark on a policy of economic development. As doi moi accelerated from 1986 onwards, prices were freed and trade was liberalised. The all-encompassing party-led state made itself a somewhat smaller part of a larger economy. State-owned enterprises began to be weaned from subsidies and slimmed down (but, crucially for the future, not dismembered or privatised). Vietnam then embarked on two decades of nearly 6 per cent annual growth in economic output per capita.

By the mid-1990s, the success of Vietnam’s business and agricultural reforms gave impetus to the enlargement of the indigenous shipbuilding industry, with the Ministry of Transport having responsibility for shipbuilding and related services in addition to ports and regulatory matters. The state-owned holding company, Vinashin – founded in 1996 and with headquarters in Hanoi, and subsequently by 2006 with more than 200 subsidiary companies, 30 shipbuilding companies, and 80,000 workers – was the country’s principal shipbuilding company with around 70 per cent of Vietnamese shipbuilding capacity in 28 shipyards of various sizes and capabilities, mainly located near large ports such as Hai Phong in the north, Da Nang, and Ho Chi Minh City. Vinashin also controlled Vinashin Lines, which included five shipping companies. It also controlled nine engineering and construction companies, twelve joint venture companies including the Hyundai-Vinashin shipyard at Khanh Hoa,44 and twenty manufacturing companies. The formation of Vinashin Lines gave Vietnam’s shipyards a

44 Established in 1996 with construction commencing in 1999, the shipyard is about one hour’s drive from the coastal city of Nha Trang. Hyundai Mipo Dockyard Co Ltd is a 70 per cent shareholder in the joint venture and controls all the commercial factors, design work, procurement, production, and service guarantees for all the vessels built in the yard. At the end of 2014, the yard was in the process of completing the third in a series of ten chemical carriers for an Italian company, D’Amico Tankers Ltd.
client base and an opportunity to demonstrate to international shipowners their shipbuilding prowess.

Vinashin’s breakthrough into the international market came in 2004 when the Cardiff-based Graig Shipping Group ordered a potential 15 Diamond 53,000-gt double-hulled dry-bulk carriers built under the supervision of Graig and Det Norske Veritas at Nam Trieu and Ha Long Shipyards.\textsuperscript{45} By this stage Graig was an established customer in China and in December 2003 had already built twenty-four vessels there.\textsuperscript{46} The first of the Graig Diamond 53s, \textit{Florence}, was launched at Ha Long in July 2007 and became the largest vessel launched in Vietnam to that date, and it was announced in September 2007 that a further twenty-seven of these vessels were on order.\textsuperscript{47} Linked to the successful Graig contracts was the first issue of sovereign bonds to the international market by the Vietnamese government in 2005. The bond issue raised USD $750 mn, and this sum was passed entirely to Vinashin to upgrade and expand existing and construct new shipyards.\textsuperscript{48}

The year 2007 was also notable, after eight years of negotiations, for Vietnam’s accession to the World Trade Organization. Accession to the WTO was intended to provide a significant boost to the Vietnamese economy, and to ensure that trade liberalising reforms continued and created options for trade expansion. However, the WTO accession also brought serious challenges, requiring the economy to open up through tariff reform, to enhance private investment and consumption, and to enable increasing foreign competition.

By 2010, however, with a double-digit inflation rate in the Vietnamese economy, Vinashin, heavily indebted, collapsed under a debt burden of USD $4.5 bn. This began a process of restructuring and downsizing of its sizeable industrial portfolio of companies through 2011-2012. In 2013 Vinashin was eventually restructured as the Shipbuilding Industry Corporation (SBIC) with eight shipyards under its control. Subsequently, nine of its executives were given heavy prison sentences including its ex-chairman, Pham Thanh Binh, who was given a maximum twenty-year sentence for violating state rules at a court in Hai Phong. The remaining eight defendants were sentenced to between three and nineteen years in prison. At the heart of the matter was a loss of USD $43 mn incurred through ship purchases without

\textsuperscript{45} \textit{The Motor Ship}, February 2004. Of the order there were five firm contracts and options for ten more. Of the potential fifteen, six were to be built at Nam Trieu and nine at Ha Long.

\textsuperscript{46} Graig Horizons (the newsletter of the Graig Group), No. 8, September 2007, Ships Built.

\textsuperscript{47} Ibid.

state approval and two failed power-plant projects. Their actions called into question governance and supervision of Vietnam’s state-owned enterprises, led to serious economic consequences, and damaged the country’s reputation with foreign investors, leading international credit-reference agencies to downgrade Vietnam’s credit rating.\(^49\) By December 2013 the People’s Court of Hanoi sentenced Duong Chi Dung, the former chairman of Vinalines, as the state-owned shipping company was known from 2010 onwards, and Mai Van Phuc, its former general director, to death for embezzlement. The two former executives were convicted of embezzling 10 bn dong (USD $474,000) each.\(^50\) These prosecutions also evidenced serious corruption with state-owned enterprises.

SBIC now operates in a climate fundamentally different from that of 1996. Not only has it been significantly downsized, but it also needs to co-operate more with foreign shipbuilders. There are now seven foreign shipbuilders operating in Vietnam;\(^51\) however, a Japanese shipbuilder, Oshima, licensed in 2012 to build a greenfield shipyard by 2017 at Cam Ranh Bay in Khanh Hoa province, has since pulled out, and may be replaced by the South Korean conglomerate, Samsung. Again this represents the vagaries of foreign direct investment; nonetheless, established foreign investors such as the Dutch Damen Group have continued to operate successfully in Vietnam and in March 2014 opened a joint venture new shipyard, Damen Song Cam at Da Nang.\(^52\) This confirms a trend for partnerships with foreign yards in LICs and allows foreign firms to expand overseas at relatively low cost. It also increases the ability of Vietnamese shipyards – through technology and skills transfer – to expand their range of ships for export. Moreover, it should in the longer term encourage Vietnam to increase local manufacture of ship components, particularly through licensing arrangements for the manufacture of high-cost items such main and auxiliary engines, and thereafter to expand its manufacturing capability and increase its productivity.

In a relatively short period of time, Vietnam, as the WTO has noted, has moved from being a low-income country with a centrally planned economy to becoming a market-led middle-income economy.\(^53\) Poverty levels have been substantially reduced, relatively high growth rates have been a feature

\(^{49}\) BBC News, 30 March 2012. \\
\(^{50}\) Bloomberg News, 16 December 2013. \\
\(^{51}\) The Dutch Damen Group with six part-owned shipyards; Hyundai; EMAS (Singapore); Piriou (France); Strategic Marine (Australia); Triyards (USA); and Vard (Fincantieri, Italy). \\
\(^{52}\) See www.damen.com (accessed 1 July 2014). Damen has constructed some 226 vessels in Vietnamese shipyards. \\
of the past two decades, and the country’s gradual integration in the world economy through a series of WTO-inspired bilateral trade agreements has enhanced its international standing.\footnote{Prior to WTO accession, Vietnam’s most symbolic bilateral trade agreement was with the USA, signed 13 July 2000.} Although there are systemic risks facing Vietnam’s financial sector and structural challenges with regard to its state-owned enterprises, particularly as economic growth has slowed, Vietnam has attempted through its Master Plan for Economic Restructuring of 2012 to address these problems to achieve its objective of becoming a modern industrialised country by 2020.