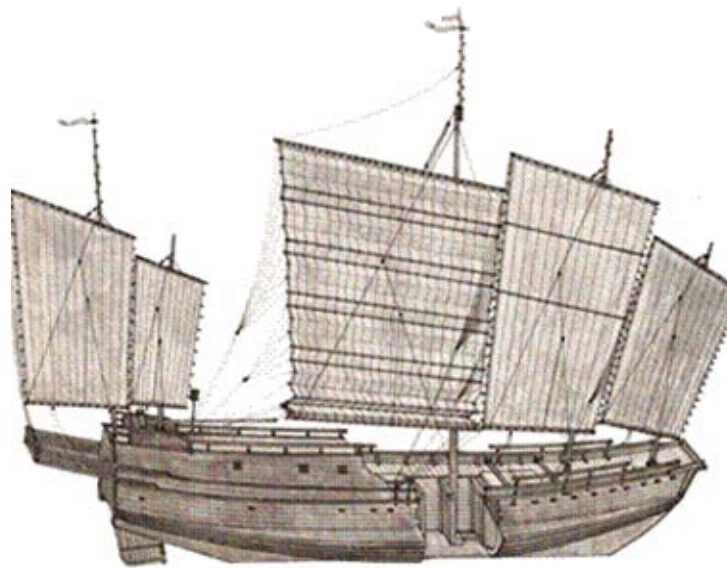


World Sea Trade Outlook; Where China fits into the Global Picture



*Exploring Shipping Business in China
Mareforum & Tradewinds Conference
26th February 2004*

Dr Martin Stopford, Managing Director, Clarkson Research



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Six hundred years ago China lead the world in maritime technology, then withdrew, leaving the way open for the European traders. Today China is back and by 2010 imports could reach 1 billion tons. This growth calls for new ships costing well in excess of \$25 billion, and recent events in the dry cargo market demonstrate the cost to importers of under-investment. But trade growth in transitional economies is always uncertain, so how will this massive shipping investment be managed?

1. China's impact on global shipping

Good morning ladies and gentlemen. My task is to review the outlook for world trade and energy, and discuss where China fits into the global picture today. This is a massive topic to cover in a short time so, with many distinguished speakers providing their detailed insights into particular aspects of these issues, I will focus on the "bigger picture".

During the last year China has helped the global shipping industry to achieve some of its best trading results for a century. Almost every sector of the shipping business is booming, and the Clarksea index, shown in Figure 1, has surged to an all time record of \$31,984/day on February 13th.

But the most remarkable development is the impact China has had on the bulk carrier market. Chinese dry bulk import volumes have more than doubled in three years, and they accounted for 94% of the growth of the dry bulk trade during that period¹. This caught shippers by surprise with the result that earnings are three times higher than has ever before been experienced. For example shipping a ton of iron ore from Brazil to Asia had an average cost \$7/ton in the 1990s, but today it costs over \$30/ton. So shipowners certainly have good reason to celebrate China's sudden and dramatic appearance as a member of the global shipping club, though cargo owners may

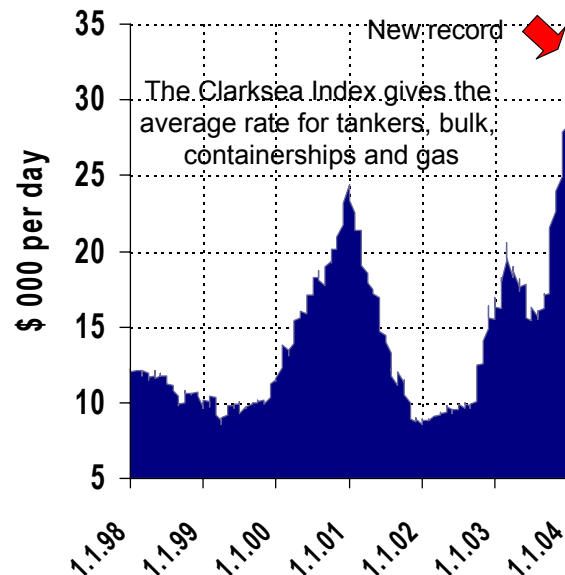


Figure 1 The Clarksea Index hits a new record

¹ See Annex 1. Chinese dry cargo imports increased from 221.6 mt in 2000 to 408.9 mt in 2003. This accounts for 94% of the growth of the dry cargo trade in the period 2000 to 2003. In 2003 China's share of dry cargo imports was 19%.



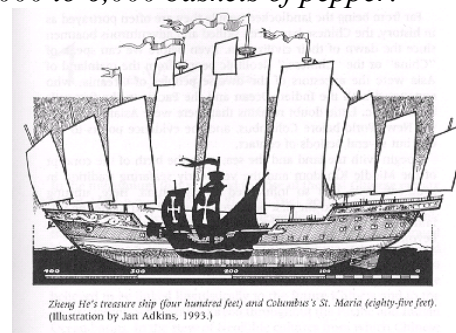
Figure 2 Advanced trade - Marco Polo was amazed to see 13th Century Chinese officials exchange paper money for a merchant's silver bullion. Paper currency was unknown in Europe at that time
 not agree! With such radical and unexpected developments, the need for perspective when looking ahead is greater than ever and that is what I will try to provide.

2. The Chinese maritime heritage

Although China may seem to have appeared from nowhere, nothing could be further from the truth. Eight hundred years ago, in 1275, when the Venetian explorer Marco Polo visited China he was impressed by the sophistication of the Chinese ocean going ships. They were far larger and more sophisticated than anything to be found in Europe at the time and in "Discovery of the World", the book he wrote of his travels, he described the Chinese ocean going junks in detail:-

"These ships...are of fir timber. They have one deck, though each of them contains fifty or sixty cabins, wherein merchants abide greatly at their ease, every man having one himself...the ship has but one rudder, but hath four masts, which they ship and unship at pleasure...Each of their great ships requires at least 200 mariners (some of them 300). They are indeed of great size, for one ship will carry 5,000 to 6,000 baskets of pepper."

At the time Chinese mariners were actively working the deep sea routes between Sumatra, Ceylon and southern India and had successfully taken over much of the spice trade from the Arab traders. They already had the magnetic compass, a navigational aid not available to European seafarers until the 15th century. Marco Polo's description of these and other marvels of the East caught the attention of ambitious sea-going Europeans, and intensified their search for a direct sea route to the east.



Zheng He's treasure ship (four hundred feet) and Columbe's St. Maria (eighty-five feet). (Illustration by Jan Adkins, 1993.)

Figure 3 Zheng He's ships & the Santa Maria



By the early 15th century China's seagoing expertise was significantly ahead of Europe's. In 1403 the Ming Emperor Zhu Di ordered the construction of an imperial fleet, under the command of Admiral Zheng He². This fleet undertook seven voyages between 1405 and 1433, with over 300 ships and 27,000 men (getting the ships so quickly must have triggered quite a shipbuilding boom!). The ships were very large, up to 540 feet long, with a capacity of up to 1500 tons. This was much larger than contemporary European ocean-going ships which at the time were typically 100 feet long with 300 tons capacity – the comparison in Figure 3 between one of Zheng He's Treasure ships and Columbus's *Santa Maria* puts this firmly into perspective³. The ships were also technically advanced, with multiple masts (the Portuguese had only just in the past century developed this innovation with their caravel design) and up to thirteen watertight compartments. In sail technology, the Europeans still relied on square sail rigs on their ocean vessels, whilst the Chinese had been using fore-and-aft lugsails in ocean-going ships since the 9th century, giving them a great advantage when sailing upwind.



Figure 4 The voyages of Zheng He

During the seven voyages the great fleet visited Malaysia, the Indian sub-continent, the Arabian Gulf, and Mogadishu in East Africa, traveling about 35,000 miles⁴ (see Figure 4). There is also some evidence that on one of the voyages the fleet sailed into the South Atlantic, and mapped the Cape of Good Hope.

3. The Westline

Admiral Zheng He's achievements demonstrate that by the 15th century Chinese mariners were ahead in oceangoing ship technology, with the ships and navigational skills to explore and trade with the world, but they chose not to do so. In 1433 the expeditions were halted, the ships destroyed, and laws passed banning further construction of ocean going ships. Sixty years later in 1496 Vasco de Gama rounded the Cape and by the 16th century Europe's maritime industry was surging forward. During the next 500 years European seafarers lead the way in developing the global sea transport system we have

² Bosworth, Michael (1999) "The Rise and Fall of 15th Century Chinese Seapower", page 4

³ These dimensions were confirmed by the discovery in 1962 of a rudder post of one of Zheng He's treasure ships at the site of one of the Ming shipyards near Nanking. It was 36.2 feet long, suggesting a ship length of 480 to 536 feet, depending upon its draught. Needham, Joseph, *Science and Civilization in China*, Volume 4 pg 481. Cambridge University Press, London, England and New York, 1954.

⁴The Ming maritime are very well documented in the form of maps, charts and travel records, some of which have been published in English, including "The Overall Survey of the Ocean's Shores", compiled by the annalist Ma Huan in 1433. Using Ma Huan's study, in conjunction with contemporary works by Kung Chen (1434), Fei Hsin (1436); earlier studies by Chao Ju-kua (1226), Wang Ta-yüan (1350); and the Ming Shih, or Ming dynasty annals, the British scholar J.V.G. Mills in 1970 published a study entitled 'China in Southern Asia, 1433'.



today. The path maritime trade followed is shown in Figure 5, which plots the “Westline” of maritime trading centers as it moved around the world.

For five hundred years the epicenter of maritime trade moved steadily west. In the 15th century Venice (and soon after Genoa) was the crossroads for trade, followed by Antwerp and Amsterdam in the 16th and 17th Centuries and London in the 18th century. By the 19th Century steamships carried the Westline across the Atlantic to North America and in the twentieth century the growth centre of maritime commerce took another giant step west across the Pacific to Japan and then South Korea. So finally in 2003, six hundred years after the Emperor Zhu Di ordered his imperial fleet, the growth centre of maritime trade has returned to China. But it's a very different world and our challenge in Shanghai today is to gain an insight into how things will develop the second time round!



Figure 5 The Westline reached China in 2003

4. China's maritime renaissance

In fact the rebirth of the Chinese merchant fleet started in the 1960s when the Chinese flag fleet was only 470,000 GT. COSCO was founded in 1961 and the fleet started to grow rapidly, doubling to 867,000 GT in 1970, 8.6 m GT in 1980; 13.9 m GT by 1990; and currently 17.3 m GT (see the bars in Figure 6). Initially much of this growth was in the cross trades and the growth of Chinese seaborne imports is much more recent, with 1995 marking the take off.

The trade growth which followed was by any standards spectacular (see the line in Figure 6). Between 1995 and 2003 Chinese imports increased from 182 million tons to 534 million tons, increasing their share of the seaborne import trade from 2% to 7%. However it was the speed of growth which made the real impact on the shipping business. No wonder it caught analysts by surprise. It took 20 years from 1974 to 1994 to add 100 million tons of Chinese imports, then the next 100 million tons took just 4 years and in 2003 alone imports increased by another 110 million tons. In 2003 the total import trade was 534 million tonnes, of which 38 per cent was associated with the steel industry and 22 per cent without the oil industry (but note that in terms of growth the steel industry was even more dominant, accounting for 60 per cent of the trade

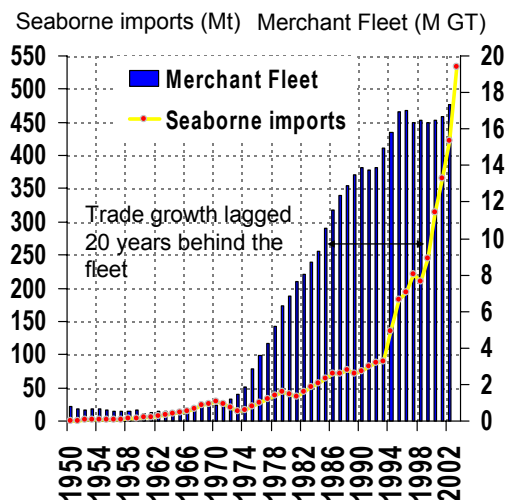


Figure 6 Growth of China's Fleet & Imports



increase in 2003). So one way or another in less than a decade Chinese imports have increased by almost half a billion tons!

To keep things in perspective, China now accounts for 19% of the dry bulk trade and 8% of total sea trade, falling just behind Japan and North America (see Figure 7). After a decade of very rapid growth we must ask how long will this period of extreme expansion will last and how volatile will it be? These are difficult questions for two reasons, both relating to China's state of development. *Firstly* the Chinese economy has a recent history of volatility, so growth will not necessarily proceed in a straight line. *Secondly* China is a large and complex economy with many domestic resources and today trade is concentrated in a few commodities (see Annex 1). The rapid growth today is typical of an economy going through a transitional phase and it is normal in these circumstances for demand growth trends to change as the economy moves towards maturity.

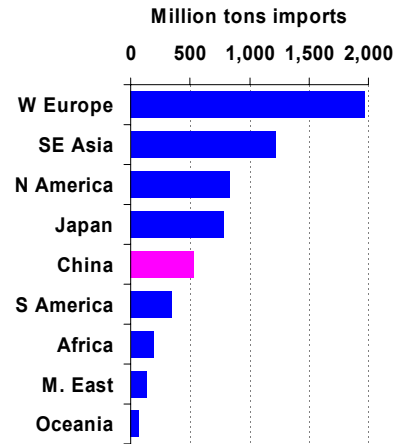


Figure 7 China's share of sea imports

5. Volatility and the Chinese business cycle

Let me start with the volatility issue. The growth pattern has been very volatile. There was a period of very rapid growth in 1993 and 1994 when the industrial economy was expanding at over 20 per cent per annum. Figure 8 shows that seaborne imports grew by 50% in 1994, collapsed in 1995, then following the Asian crisis in 1998 imports actually fell by 4%. That was only six years ago, so it can happen! Since then growth gradually accelerated to a current growth rate of 17% per annum. This is still well short of the growth rate during the "bubble" period of the early 1990s, but it is a very high growth rate for the much larger Chinese economy which exists today. So there are grounds for approaching forecasts with a degree of caution. If past trends are any guide, when growth slows the change could be pretty dramatic.

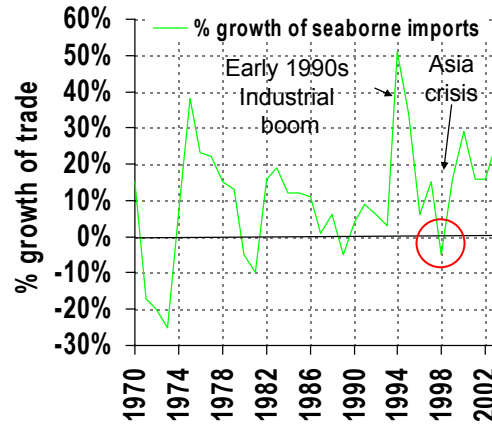


Figure 8 Volatile growth of seaborne imports

Forecasters expect the Chinese economy to continue to grow rapidly, but with a tendency to slow. For example a report by Goldman Sachs published in October 2003 assumes that Chinese real GDP growth will be 8% pa from 2000 to 2005 and 7.2% from 2005 to 2010. We believe this tendency to slow will be much more apparent in the industrial sector, because of the strong stockbuilding element in the demand for commodities such as steel!



6. The Chinese industrial economy in transition

When we consider the second issue concerning China's transitional economy, we must be ready for growth trends to change significantly over the next few years. Typically developing economies go through a series of stages illustrated in Figure 9. At the development stage the focus is on raw material intensive industries, then as stocks are built up demand moves on to more service orientated activities. Stopford (1997)⁵ summarizes the process as follows:

“As the economy develops through stages 2 and 3, the demand for raw materials such as iron ore, coal, non-ferrous metal ores and forest products increases as the industrial infrastructure is built up. If raw materials are not locally they must be imported, as must the more sophisticated machinery, and paid for by exports of semi-manufactures and any primary exports which are available. The reconciliation of domestic and foreign markets thus forms a basic requirement of growth at this stage. Industries such as shipbuilding and automobiles are frequently developed as lead export earners; a pattern set by Japan in the 1950s and subsequently followed by South Korea and several other countries”.

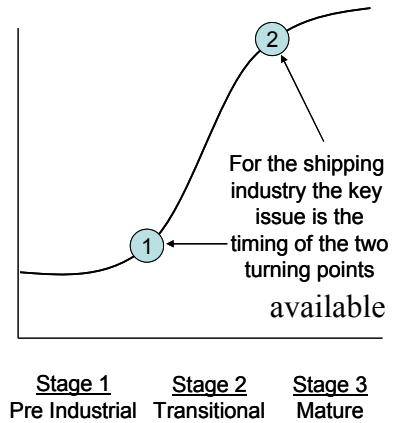


Figure 9: Trade development cycle

Today the Chinese economy exhibits many of these symptoms, but the whole process seems to be progressing even faster in China than it did in Japan, or S Korea. Industry has grown at 13.9 per cent per annum since 1990 and the construction, motor vehicles, shipbuilding and consumer durable industries are all prominent. One explanation for this rapid growth is the increased efficiency of the shipping business, especially containers. Modern communications and the global logistic system has made it possible to develop fast and cheap distribution systems on a scale that would have been impossible thirty years ago when, for example, Japan was going through the same process. For example the combination of massive retailers like Wal-Mart⁶ with fast cheap containership services across the Pacific provides a super-highway for exporters to access the remote markets of the American Mid West. Nothing like this was available 30 years ago when Japan was developing its economy.

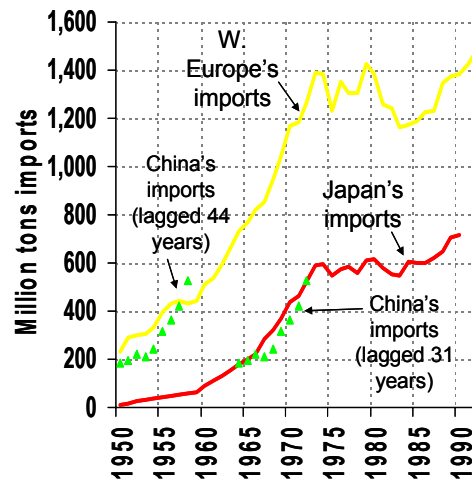


Figure 10 China in the footsteps of Europe & Japan

⁵ Stopford, Martin (1997) Maritime Economics page 242

⁶ Wal-Mart has a team of 300 permanent buyers in China and imported \$12 billion of Chinese goods in 2003 for sale in its stores throughout the USA

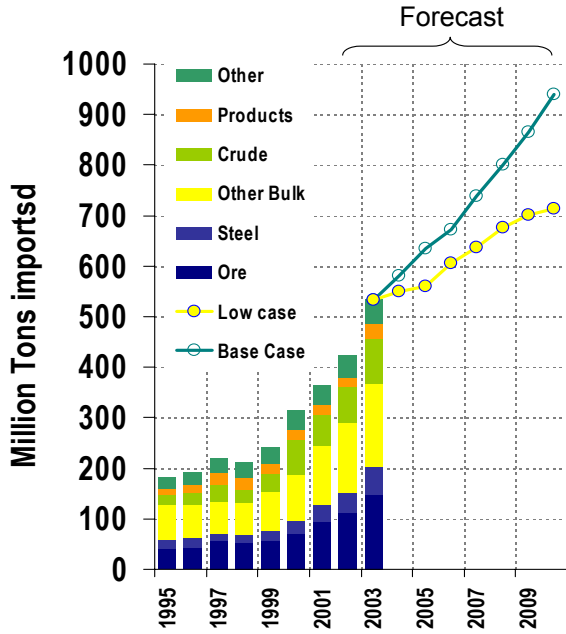


Figure 11 Chinese imports head for 1 billion tons

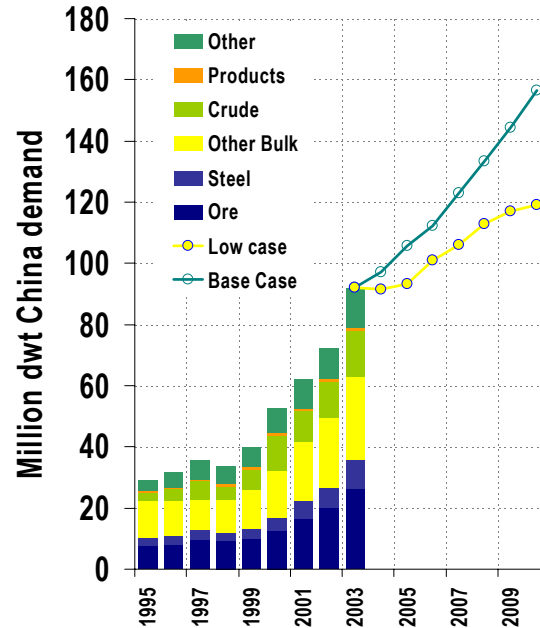


Figure 12 But how much ship demand?

Since China is currently at the raw materials intensive stage in its development cycle we must be especially aware of the changing relationship between trade growth and the development of the underlying economy. Since the products at this stage, especially those concerning the metals industry, are of a durable nature, typically demand grows very rapidly as domestic industry builds capacity to supply these needs. However once stock levels have been established, growth subsides and demand stagnates. Figure 10 shows what happened in both Japan and Western Europe – trade growth stopped very abruptly and trade stabilized. It will certainly happen in China at some stage. So the issue ahead of us is to determine the slope of the trade development curve over the next five years, and the point at which it will "peak out".

7 Outlook for the growth of Chinese trade

Which brings us to the trade forecast. China's imports grew from 182 mt in 1995 to 533 mt in 2003 (see Figure 11) and our analysis of the major trades, particularly iron ore suggests that imports could reach about 950 mt in 2010. This staggering figure is not far short of 1 billion tons! To put this in context, by 2010 we expect world sea trade to reach 7.2 billion tons, so China will account for 14% world imports by 2010 and almost half the growth (see Figure 13)! We did not prepare equivalent projections for the liner export trades, but the forecasts are equally spectacular.

The ship demand generated by this trade is difficult to estimate accurately because of the complexity of forecasting where imports will come from. However on a very rough basis my estimate is that ship demand will increase by about 64 m dwt, as shown in Figure 12.⁷

⁷ This was calculated by using a standard productivity factor of 6 tons/dwt. It does not take account of exports, especially containership demand which is much more complex to calculate due to the joint services operated in the China trade.



However for all the reasons I mentioned earlier, this projection is subject to wide confidence limits. Let me briefly summarize once again the problems facing forecasters in dealing with the future of Chinese trade. *Firstly*, China is a transitional economy. At some stage growth will slow and there is no economic model for predicting exactly when this will happen. As we saw in the case of Japan and Europe, when the trend changes the impact can be sudden and dramatic⁸. *Secondly* as a high-growth economy China is vulnerable to "crises" and its history of growth has been volatile. These crises interrupt growth, resulting in demand stagnation, which for shipowners who must invest ahead of time is always serious. *Thirdly* China, like Europe, is a resource rich economy and the countries adjacent to the land boundaries offer access to resources and which may not be brought in by sea. This makes judging import levels difficult. For example there are plentiful supplies of oil and gas which could be brought in by pipeline available from Russia and the Caspian and the country has massive coal reserves. *Finally* in the liner trades the impact of China on foreign markets has been so great that there is always the risk of a reaction, and of course price rises or currency realignments.

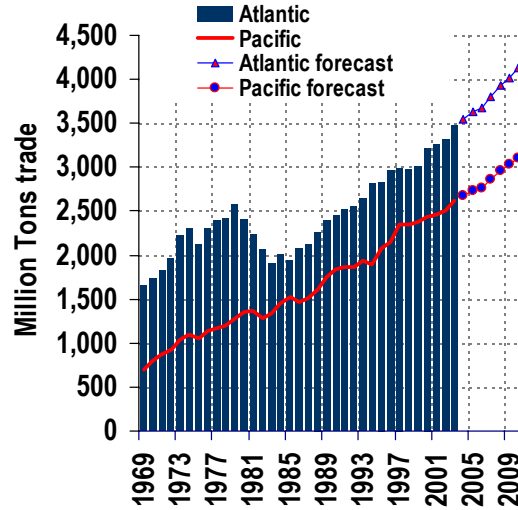


Figure 13 Seaborne imports growing steadily

For all of the above reasons growth forecasts are subject to wide margins, and to emphasize this point we have included a low case scenario in Figure 11, under which Chinese import trade grows only to 714 million tonnes in 2010.

8. The challenge for the shipping industry

From the shipping industry's viewpoint the speed of ship demand growth is what really matters. Under the two trade scenarios my rough estimate is that the demand for merchant ships will increase by 50-80 m dwt in the period up to 2010 (see figure 12). That represents an investment of over

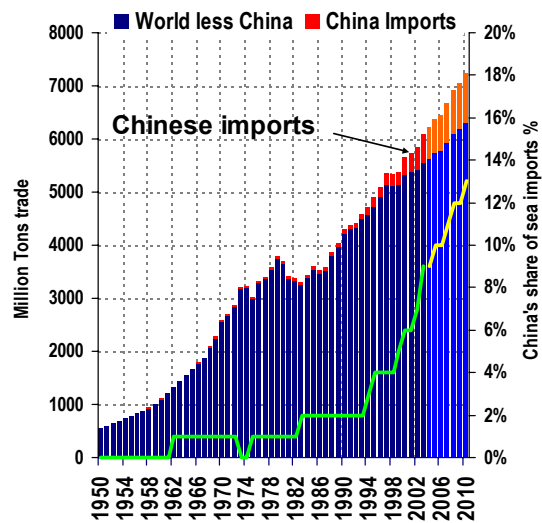


Figure 14 Sea trade projection including China

⁸ There are other reasons why trade may slow even if the economy is growing. For example the current imports of 55 million tonnes of steel products (see Table A1) will could reduce significantly as the domestic steel industry develops. Since China imports iron ore but not coking coal, if China becomes a net exporter of steel products, at the expense of Japan or South Korea, that would actually reduce total sea trade volumes.



10 m dwt per year for ships to carry the extra imports, costing in excess of \$25 billion dollars⁹. Given the uncertainties about the rate of trade growth, this raises very real questions about where this investment will be undertaken and who will carry the risk. Will it be largely covered by the expansion of the Chinese fleet? Or will China continue, as it has done recently, to rely on the international shipping market to provide the vessels that are needed. Both strategies have advantages, but the events of the last six months have demonstrated that sub-contracting shipping can be expensive for importers, and I feel sure that this has not gone unnoticed.

9. Conclusion

In conclusion, we are meeting at a fascinating time. The *Westline* has circumnavigated the globe and China is once again leading the growth of maritime trade. Nobody can deny the enormous value which shipping has added to the Chinese economy in recent years by transporting its raw materials imports and delivering its exports to overseas markets. Nor the benefit that international shipping has gained from this new and dynamic force in the industry.

Looking ahead, by 2010 imports may be close to 1 billion tons, and that will require a great deal of investment in new ships. So, Mr. Chairman, the bottom line is *investment risk*. To keep the wheels of trade turning these ships must be ordered ahead of time, and in a transitional economy there is always the risk that demand falls short of expectations. So how will this risk be managed? Will it be taken by Chinese shipowners or left to independents as in the recent past? Whoever it is, they would be well advised to be careful about timing and remember the advice of *I Ching*, the Chinese Book of Change....

“The case is like that of sailing a boat; if you do not cross the stream at the proper time, you will destroy all the cargo”

I Ching (the Book of Change)

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Saturday, February 21st, 2004

⁹ This calculation relates only to import trade and does not include exports (especially containerships).



ANNEX 1

Table 1: Chinese Imports 1995 to 2003 (estimate)

	1995	1996	1997	1998	1999	2000	2001	2002	2003(e)
Dry cargo									
Iron ore	41.2	43.9	55.0	52.0	55.4	70.0	92.4	111.5	147.6
Iron and steel	16.6	18.2	16.1	15.6	20.9	26.5	37.0	39.6	55.1
Chemicals	6.0	7.0	6.8	9.1	13.3	14.8	21.0	26.7	31.2
Soyabeans	0.3	1.1	2.9	3.2	4.3	10.4	13.9	11.3	23.6
Plastics	8.1	9.2	10.6	11.7	13.8	15.6	17.6	19.5	20.9
Woodpulp	1.7	2.7	3.0	3.9	5.4	6.9	11.1	12.0	15.1
Fertilizers	19.9	18.6	16.5	13.9	13.4	11.9	11.1	16.8	12.9
Coal	1.6	3.2	2.0	1.6	1.7	2.1	2.5	10.8	11.0
NFM ores	3.7	4.0	3.8	3.7	3.8	5.3	6.9	7.3	9.8
Waste paper	0.9	1.4	1.6	1.9	2.5	3.7	6.4	6.9	9.2
Veg oils/fats	4.1	3.0	3.0	2.4	2.7	2.8	2.6	3.9	5.8
Copper	1.8	1.5	1.5	1.8	2.9	4.1	5.0	5.4	5.8
Sulphur	0.1	0.5	0.4	0.9	2.0	2.7	3.4	4.1	5.0
Pet coke	0.3	0.4	0.8	0.9	1.5	1.5	1.9	3.6	3.6
Cement	0.3	0.1	0.2	0.2	0.5	1.4	2.8	2.4	2.5
Grain	20.3	10.8	4.1	3.8	3.3	3.1	3.4	2.8	2.3
Other imports (lin	21.4	25.4	30.0	31.1	33.4	38.9	39.2	42.4	47.4
Total Dry cargo	148.2	150.7	158.0	157.8	180.7	221.6	278.3	327.0	408.9
Oil & energy									
Crude oil	17.1	22.6	35.5	26.8	36.6	70.1	60.3	69.4	89.6
Oil products	14.4	15.8	23.2	21.6	20.8	18.0	21.4	20.4	28.8
Petroleum gas	2.4	3.7	3.7	4.8	5.6	4.8	4.9	6.3	6.4
Total imports [^]	182.0	192.8	220.4	211.0	243.7	314.6	364.9	423.0	533.7
% growth		6%	14%	-4%	15%	29%	16%	16%	26%
					8%				22%
[^] excludes items not measured by weight									
Source: China Customs Statistics, CRS									
Memo:									
World Dry Cargo	1696	1722	1794	1780	1803	1918	1964	2009	2117
China % world	9%	9%	9%	9%	10%	12%	14%	16%	19%